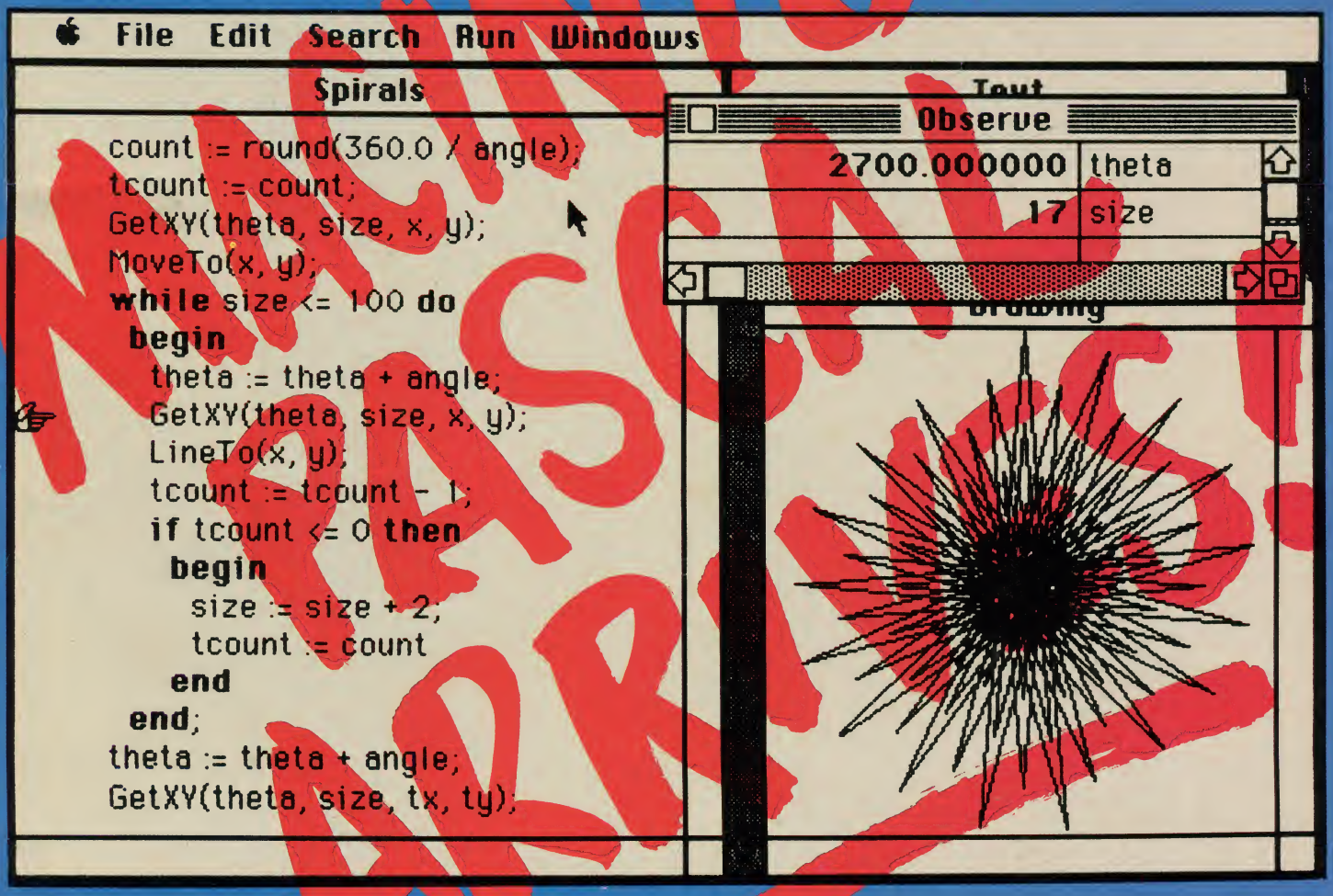
ST.MAC

Volume 1 July 1984 $2.00

MACINTOSH PASCAL ARRIVES!



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ST.MAC

JULY 1984

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VIEWPOINT

Where's the Software?

Making Mac Owners Make Do

It is now July, six months after Apple introduced the Macintosh. By now, an estimated one hundred thousand machines are in use. Virtually everyone who wants one can get one. Which raises a question: Where is all the software going to come from to keep these disk-hungry Mac owners satisfied? Better yet, *when* is all the software going to be available?

In January, software didn't seem like a problem. When Apple unveiled Mac, the company said there were one hundred-plus developers writing software for the machine and that by the end of 1984 there would be more than five hundred software packages available.

Today, halfway through the year, there are less than one tenth that many packages.

But software is on the way, we're being told. Among the long-awaited programs are *Helix* from Odesta, *MacDraw* and *MacProject* from Apple, and *Word* from Microsoft, and they seem to be in great demand. Go to a Mac user group; see what people are saying on CompuServe, The Source, or any bulletin board system that has Mac owners on it; talk to computer dealers. They're just dying to lay their hands on the stuff.

It's the right of Mac owners to expect developers to have software available. After all, they promised; they'd better deliver. But are complaints about a sparse software market justified? When they bought their machines, Mac owners knew there wasn't much software available. These are the same kinds of people who probably would have bought a car, knowing gasoline would be in short supply; you might have seen them at the stereo store, purchasing compact disc players, despite the small number of compact discs on the market. Mac owners wanted to be part of the pioneers, and now they're complaining about the price they're having to pay.

That "price" isn't the inability to perform certain tasks; it's the inability to buy programs that help do those tasks.

MacDraw isn't out yet. So what? Make a list of all the things it could be used for. Try to remember the way we did those things without *MacDraw*. Oh yeah, pencils, compasses, and rulers. Get out the reference manuals so we can refresh our memories on how to use them.

Word isn't finished. Fine. How did modern civilization ever get along without it? Well, there was *MacWrite*, *Apple Writer*, *WordStar*, and a few other archaic programs. Not to mention the typewriter and the pen.

The Mac version of the IBM PC workhorse *1-2-3* isn't available yet. Good heavens, that means we'll have to settle for *AppleWorks* or *III E-Z Pieces*.

This isn't to suggest that we dump our Macs and go back to the old technology. Rather, the new technology is great, but the old has served (and will suffice) until the new is ready. It's preferable to wrestle with *WordStar* and prepare a report correctly than to breeze through with the ease of *Word*, only to have the program crash in the middle because it was rushed to the market too soon. But, that doesn't mean software developers are justified in taking too long to finish a product.

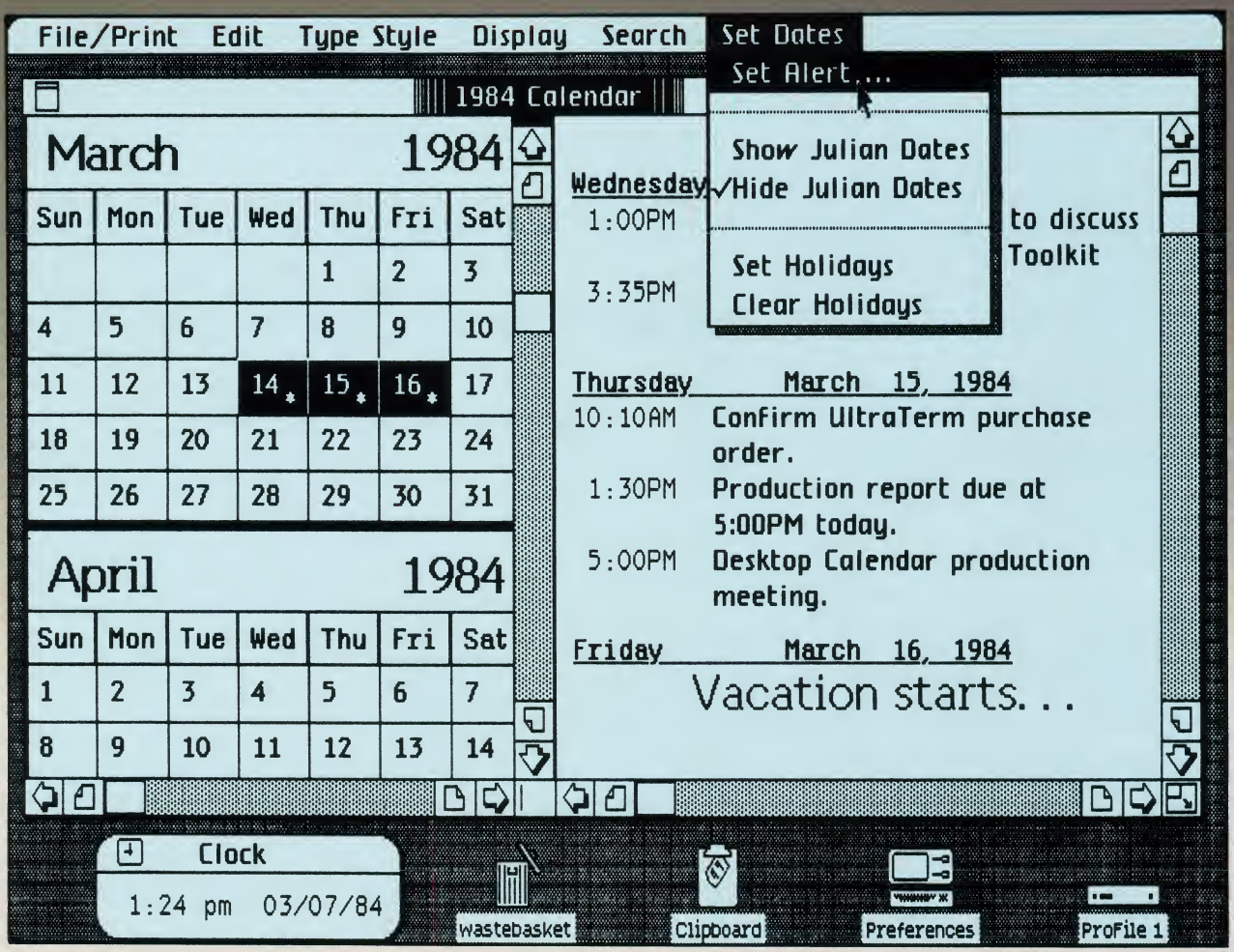
The Mac is a tool. Like other tools, it's only as good as its operator, and that includes the person who uses it and the software that runs it. Because the Mac is virtually a closed machine, it can't be easily programmed by its owner the way most other computers can. Thus, the only source of programs is a pool of developers designated by Apple. If those developers don't produce, then Apple has produced a useless tool.

Who's to blame for such a slow beginning? It isn't important. What is important is the discrepancy between Apple's idea that Macintosh was to have a major effect on the way we work this year and the reality that many of us are still working much the same way as before.

Whether software developers are justified in taking so long to come up with the goods, and whether Mac owners have the right to be spoon-fed even though they were aware of the software situation, can be argued for days, and still no conclusion will be reached. The software isn't ready, and that's all there is to it.

Introducing Macintosh was an important step for Apple and the microcomputing industry as a whole. However, with the other foot still stuck to the lower rung, that first step isn't making much of a difference. Until software comes out, Mac owners should do nothing but wait. Quietly.—Matt Yuen

INTRODUCING



Desktop Calendar for your Lisa 2

Desktop Calendar, a new tool for the Lisa 2, will improve the way you work because it helps you manage your time.

Your're an important person. Working hard to get the job done. But what happens if you get so involved in your work that you lose track of time? Missing an important appointment or meeting can mean disaster.

If you put the times and dates of all your important appointments and meetings into Desktop Calendar, it will automatically remind you of them in time for you to meet your commitments. Once you place Desktop Calendar on your electronic desktop, you can use your computer to write a letter, recalculate a schedule, prepare a financial statement, or use any of the Lisa Office System Tools. At the proper time Desktop Calendar will interrupt, reminding you of your appointment.

Talking on the phone to an important client? Want to know all the dealings you've had with them for the last three months? Desktop Calendar will search through its electronic notebook and tell you. Want to know the address of an important business contact named 'JONES'? Desktop Calendar will tell you that too.

Desktop Calendar is more than just a calendar for your computer. It will also keep track of appointments, hold addresses for easy reference and remind you of important events, even when you are busy working with another tool in the Lisa Office System.

Desktop Calendar will be available third quarter 1984 from Videx.

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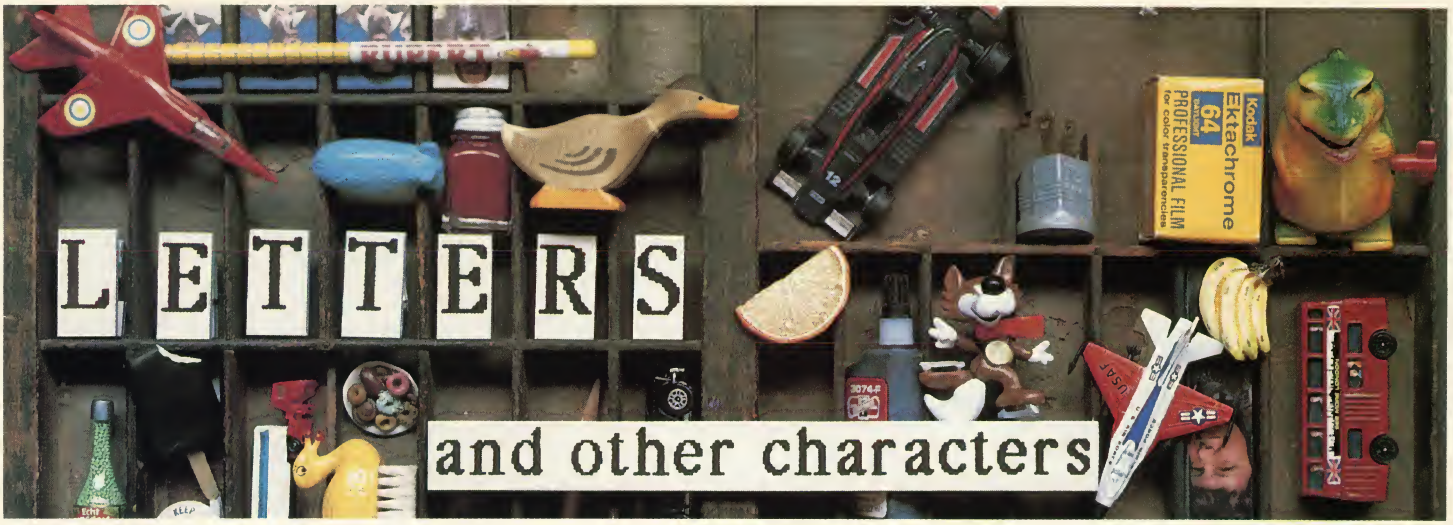


Penitence

My first impression of *ST.Mac* was not a good one. Due to the small size of your magazine and my dislike for the title, I let a week pass by before I decided to give it a try. What a mistake on my part. Now I can hardly wait for each new issue. My only complaint is that it is too thin and takes only an evening to read. Can you fatten it up somewhat? Heck, I'd even be glad to see more ads.

P.S. If I had been aware that *ST.Mac* was put out by Softalk, I would have picked it up a lot sooner. How can I obtain the first issue?
Thomas F. Booze
Manhattan, KS

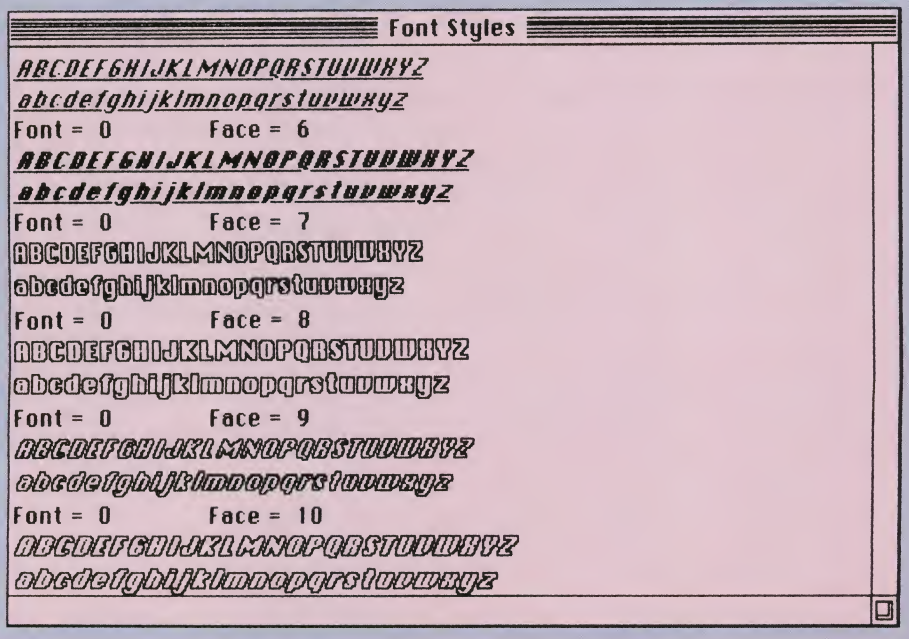
You'd *be glad to see more ads...! Advertising pays most of the bills at Softalk Publishing, and for our first few months the advertising in ST.Mac didn't come close to covering our costs of production. Of course we'd love to put out a hefty magazine, with lots of gorgeous illustrations, high-quality screen printouts, and layouts with a bit more...ummm...breathing room. But this is as big as it gets until the software market picks up, and then, well...we're all waiting for that day, aren't we?*

Thanks for giving us the chance to plug our back issues—your complimentary copy's in the mail. Other readers can obtain back issues (from February 1984) by sending $3 per issue (please specify the issues you want) to ST.Mac Back Issues, Box 7041, North Hollywood, CA 91605.

Faces in Shadow

While reading the May issue of *ST.Mac*, I came across an incorrect statement in the item entitled "The Niceties of Microsoft Basic Text" in the Clicks & Pointers section. In the short discussion of text faces using the *call textface(n)* command, the article states that "shadow and outline don't seem to be supported." This is not the case. *Call textface(8)* will result in outlined text, and *call textface(16)* will result in shadowed text. Enclosed is a listing of the program along with snapshots of the output window showing the different text faces. I didn't include all thirty-two faces, but you get the idea. Some of the underlining effects will be different, depending on which text mode is called.

The way to get all the available faces and fonts is to either load all the fonts, using the Font Mover, into the System file on the MS-Basic disk or, easier yet, trash the System file that came with the MS-Basic disk and copy a new System file with all the fonts already included onto the MS-Basic disk from another disk (such as the System Disk that came with the Macintosh). Then Basic can print in all the available fonts and faces.
Keith D. Renz
Grand Forks, ND



Almost Software

In his review of my book, *The Apple Macintosh Book*, Bruce Webster asks why I didn't mention software publishers other than Apple and Microsoft. The answer is simple: I only described applications software that I saw running in some form. I talked to more than twenty other software publishers while writing the book, but none of them were ready; most of them didn't have a working program at the time.

As Softalk's staff can attest, many announced products never see the light of day. In my book, I point out that no book can ever be completely up to date; Mac owners looking for the latest software should read magazines—such as *ST.Mac*.
Cary Lu
Watertown, MA

Loaded Comments

You are guilty of double-talk (binary-speak?) in the March issue. In the article entitled "Secrets of the Finder," Bruce Horn claims that the System and Finder are entirely on disk; then Steve Capps says that the whole operating system is in ROM.

When using my Mac, I notice that the Finder cannot be found but may be encountered in a dialog box when something goes wrong. Also, if the System folder is put in the trash, the next time you attempt to boot up with that disk Mac's eyes go blank.

When my Mac was new and I had no idea how to control the I-beam cursor, I acciden-

tally bumped the backspace key a couple of times and retitled the names of my Guided Tour disks. The most severe repercussion was the loss of the proper name to the Session 0 document (which must act as an Exec file). My Mac refused to even give up its disk. A cold on/off switch with the mouse button depressed worked. The System disk booted, so I ejected it and went to look at Guided Tour. Mac had me swap disks ten times to repair the files, and then I straightened out the names. Sad to say, I cannot reproduce the error.
E. Christis Farrell
Wellsville, OH

Different people apparently use the term operating system *in different ways. Capps was referring to the low-level operating system functions. The Finder and System files contain the shell, or front end, of the operating system: the command level, which is, admittedly, what most of us think of when we say* operating system.

We may be guilty of double-talk, but you're certainly afflicted with a severe case of technospeak ("A cold on/off switch"?) May we assume you mean you turned the machine off and then on again, or are you working in an overly air-conditioned office?

Modifying Multiplan

I have discovered a number of interesting facets of the Macintosh that not many people seem to know about (or that have not yet surfaced in your magazine or from Apple).

But before I get into these subjects I would like to tell you about our local Macintosh user group. Kirksville-Macintosh Users Group (K-MUG) was formed shortly after the release of the Macintosh. Our group broke off from our standard user group (Apple Core Computer Club, AC^3) after we realized we are a new and totally different breed of Apple owners and operators.

Our group is located in Kirksville, Missouri, which is a small rural town in the northeast part of the state. We have a very informal group of very excited users, always wanting more information and, of course, more software programs! So, rather than complaining about our situation, we are doing something about it. We have started a library of public domain software written entirely by members of our user group! We have also started an art gallery to display our *MacPaint* creations.

A very important discovery of my own concerns Microsoft's *Multiplan*. As you know, *Multiplan* is an incredible program that uses the features of the Macintosh to an incredible degree—with a couple of minor exceptions. One of those exceptions is a very limiting one—the number of characters that can be displayed on the screen and also printed on the Imagewriter. Here is my solution to this unyielding problem.

By taking the new version of the Finder (version 1.1) and the new System file from the prerelease version of *MacTerminal* and replacing it on my *Multiplan* boot disk, I got

an incredible result: Geneva-9 with incredible clarity. With this new font, I am able to have 110 characters by forty-seven lines on a standard *Multiplan* template in the wide format.

A couple of words of explanation: It seems as if *Multiplan* uses a Toronto font as its system font. There are two Toronto fonts on the original disk, Toronto-10 and Toronto-20. But by removing these you get a nine-point font with very distorted results, which seems to be New York-12 decreased in size. New York-12 is a system font and cannot be removed from the System file. But in the new System file of the prerelease version of *MacTerminal*, the New York-12 font has been replaced by Geneva-9 as the system font. So *Multiplan* uses Geneva-9 as its system font, with some wonderful results.

Hope this information is as valuable to other Mac users as it has been to me!
Vic Treutel
Kirksville, MO

Multiproblems

I have enjoyed the first few issues of *ST.Mac* and thank you for this opportunity to make my comments. I purchased a Macintosh in mid-February. I had been considering purchase of a personal computer for six months and studied the market carefully. One of my

Moving Mysterious Characters

I was poking around in Basic on my trusty Mac the other day when, to my surprise, a robot popped out on my screen. My curiosity piqued, I decided to explore further. In doing so, I discovered that the character is produced by the Shift-Option-Tilde key combination and that its ASCII value is 217. From this starting point, I decided to look at this robot in more detail with *MacPaint*.

Imagine my further surprise when I found that, at different point sizes, the robot transformed into other characters: a heart and musical notes. When I tried other fonts, still other interesting characters popped onto my screen. At that point, I decided to turn my attention to *MacWrite*, with which I prepared a matrix showing the mystery character set in all its manifestations. I enclose a copy of this for the interest of other readers who might not yet have discovered this little surprise for themselves. Obviously, someone at Apple was having some fun!

I note that the reason the mystery characters do not appear when using the Key Caps accessory is that this accessory uses the Chicago font, and the mystery characters are not implemented in this font. I have also found that not all of these characters appear in Basic. The only ones I have been able to produce with Basic are the robot (default font 1 and most others), the sheep (font 3), and the triple line (font 4). I have sought other mystery characters but have failed to find any.
James C. Robertson
Vienna, VA

Try using Font Mover to transfer fonts from your System Disk to your Microsoft Basic disk. All the mystery characters should be accessible to Basic programs, provided the fonts they reside in are present.

Mystery Character

Font	9-Point	12-Point	14-Point	18-Point	24-Pt.
New York	♥		♫	♥	
Geneva					
Toronto					
Monaco					
Chicago					
Venice					
London					
Athens					
San Francisco					

primary reasons for buying a personal computer was to perform financial calculations (spreadsheet analysis). When I used Microsoft's *Multiplan* on the Macintosh, I was sold. I was using *Multiplan* in five minutes and without reading the instruction manual.

The first thing I did with my Mac was set up a financial program with *Multiplan*. Everything worked fine until a few days later, when I went to use that program again. To my dismay, when I made a few changes my Mac went crazy. The next thing I knew, a cute little bomb with a lit fuse appeared on the screen with the message "A major system error has occurred." It gave me the choice of restarting the current application or starting back at the disk icon, along with an ID=02 code. Wonderful, I said. It's the world's easiest computer and they haven't given it decipherable error codes. And, to make matters worse, only the choice to go back to the disk icon would work. The other one didn't do anything when I clicked on it.

That was the start of many problems that have since made me regret my purchase of a Macintosh. It took two weeks for the retail store where I had made my purchase to figure out that the *Multiplan* software was at fault. Communications with Microsoft were difficult; I either couldn't get through or got put on hold for forty-five minutes. Microsoft sent a "second-release" copy to the store and claimed the bugs had been worked out. I used the new copy and it also bombed. That was four weeks ago. The latest word from my retailer is that his Apple representative heard that Microsoft will be sending out debugged copies sometime in the future.

Here I am with a $3,500 investment that I can't use in the way I'd originally intended. Another case of getting a product out before it was ready. One small consolation: I'm using *MacWrite* extensively now, with much better success.

Macintosh is a wonderful tool. I'm sure it will be a tremendous success. It's too bad that Microsoft has tarnished the image already.
Michael H. Moore
Richmond, VA

Microsoft has mailed an updated version 1.02 of Multiplan *to owners of the buggy version 1.0 who mailed in their registration cards. The company apologizes to 1.0 owners who were not notified of the update because they had not returned their warranty cards. Owners who have not returned their cards should do so to receive the free* Multiplan *update.*

Please Remain Calm

I was quite concerned that you failed to comment on the letter submitted by Ronald K. Long in the April issue of *ST.Mac*. Has he hit too close to home in his evaluation of the Macintosh, leaving you speechless and unable to respond?

I too am curious about the apparent lack of eighty-column capability for word processing functions. In fact, nowhere in Mac literature can I find any discussion of "columns" when it comes to the Mac's word processing capabilities! Is this a major drawback of the machine? After all, it would be nice to be able to see your document on the screen just as it will appear in print.

Second, Mr. Long commiserated on the apparent lack of sufficient RAM to allow more program memory to reside in that RAM, thus avoiding disk swaps. Will we be able to retrofit larger RAM chips (such as 256K) in existing Macs or will a complete system changeout be required?

I am just to the point of ordering a Mac, but I have some serious reservations! I'm sure many other prospective buyers would like answers to these questions before they plunk down $3,000-plus for the Mac and peripherals. I have an Atari 800 (which I will keep) that is fine for what it does, but I want a *true* business computer, which I thought the Mac was! I'm not so sure now....
L.B. Stilwell II
Springfield, IL

If we were made speechless, it was only because Long's criticisms were based on concepts that have been made outdated by the Macintosh. It is pointless to speak of columns when you are using proportionally spaced type. How many columns of characters are there on this page? You can't count them exactly because there is a different number of characters on each line, giving the text a more natural look. Different characters take up different amounts of space. So it is on the Macintosh. This isn't a drawback; it's a major advantage.

In those situations where you want characters to line up in columns, the Monaco typeface can be used. All of its characters are the same width. In the nine-point type size and the Monaco font, the Macintosh can indeed display eighty columns. MacTerminal *will take advantage of this fact to make its output window more closely resemble the display of a conventional computer.*

When a memory upgrade is available, it will be accomplished by swapping the entire logic board. This is also how broken Macs are most often repaired. Although it sounds wasteful, it means that turnaround time on repairs is faster, stores can more easily provide such service, and Apple can keep track of the things that are breaking most often.

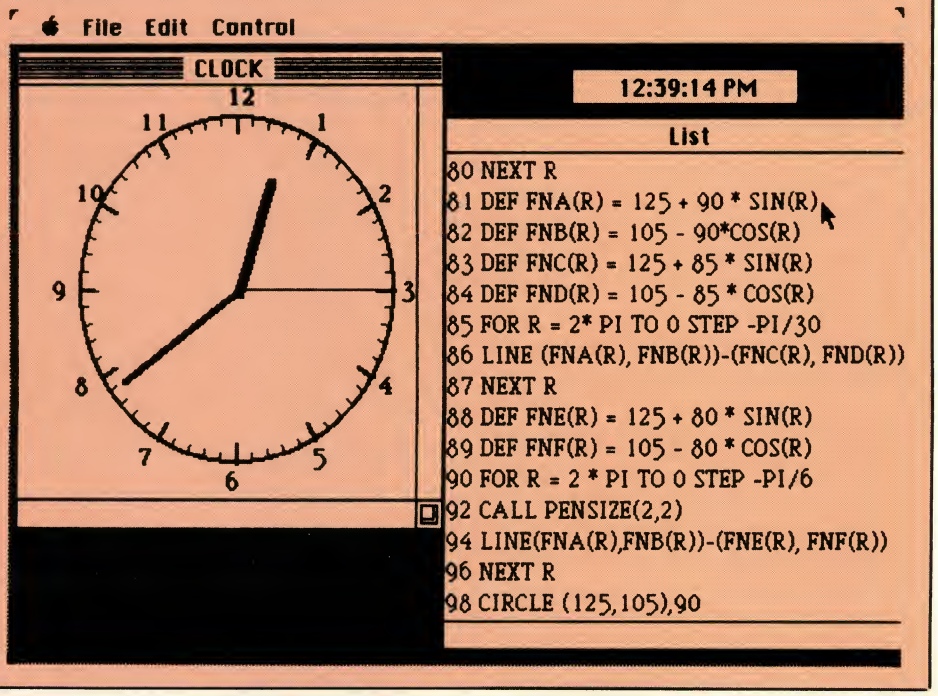
By the way, a solution to the disk-swapping problems that is available now *is to get a second disk drive. There may still be a wait for delivery of external drives, but at least the dealers are taking orders.*

A Better Clock

I tried the Microsoft Basic clock program that was presented in your March issue ("Mac Learns a Language") on my Macintosh. My son, however, had some difficulty determining where the second and minute hands were between the numbers. To help him, I made some enhancements to the clock program, which are displayed and listed below in lines 81 through 94. I also used *call textface(1)* to boldface the numbers and added the following to line 230: IF OS<>S THEN LINE.... This last bit gives the second hand a nice tick instead of a flicker.

Thanks for the program.
Roger Riggs
Grafton, VA

Thanks for the enhancements.



ST.Mac would like to hear your reactions to articles as well as your views about the world of personal computing. Send your opinions, queries, suggestions, and solutions to ST.Mac, Box 7041, North Hollywood, CA 91605.

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DANIEL PINKWATER and the

Serious Art Machine

Photo by Robert Lewis

Nineteen-eighty-four will be remembered as the year Apple created a pixilating art box for scribblers and scribes called the Macintosh. The personal computer for art's sake. The Cuisinart of image processing at the door of the Museum of Modern Art, eyeing a niche in the technology wing.

MacPaint will be remembered as the tool that transformed fooling around into fine art. Put the package in the hands of a true fine artist and you get—well, ever wonder how Edgar Bergen got that dummy to talk?

In the hand of children's book writer and illustrator Daniel Pinkwater of Hyde Park, New York, that darn mouse is alive. Pass the cheese please, Louise.

Pinkwater calls himself a serious person, but there is considerable evidence to the contrary. Most of it lies between the pages of his many whimsical tomes for teens with their trippingly turgid titles. Just meeting up with *The Snarkout Boys and the Baconburg Horror* and *The Snarkout Boys and the Avocado of Death* (Lothrop, Lee, and Shepard), *I Was a Second Grade Werewolf* and *Devil in the Drain* (E.P. Dutton), *Lizard Music* (Dodd, Mead and Company), and *Ducks!* (Little, Brown) and Company) on a library shelf is enough to convince thousands of adolescent "misfits" that Pinkwater is on their side. Hooray for sillyhood.

Pinkwater has written, "If I can't inspire large groups of people in red plastic clown noses to march through the streets, I've failed to live up to the demands of my art." Honk if you brake for Bozos.

Pinkwater's books run the gamut from picture books to novels. His prolific writing ability (up to five books a year) has netted him

by Mike Ferris

"one or two minor awards," he says, but no bookstore or bestseller noise. "It's schools and libraries, and that's all, folks."

Are they, as some would suggest, "second-class books" because they're fun? Well, at least the kids love them, and so do some S-F adults. Writing for kids is "paradise," Pinkwater brags. "I can do as I please as long as there are no dirty words."

Pinkwater brooded for a month before he finally purchased his Macintosh. Now he spends an hour or two a day at it, rediscovering the pleasure of sketching, a habit he dropped when he went professional. Art isn't just a job anymore.

The art presented in this Pinkwater portfolio is for a storybook with pictures to be released in the spring of 1985. *Jolly Roger: A Dog of Hoboken* is the story of a crafty canine that becomes boss of the waterfront dogs. Yes, it's a shaggy dog story, a story with a "cheap ending," confesses the author. J.R. is a half chow chow, half husky from Pinkwater's past. "A very cool dog who could handle anything," he says, from drifting out to sea on an ice floe to getting his mug squeezed onto a tiny computer screen.

The illustrations were created with *MacPaint* and printed on "nice fake bond computer paper, complete with perforations," says the artist, possessor of a degree in fine art and a black belt in woodcuts. The drawings have the quality of an original art print with just enough computerese to seduce a techie. In fact, "every print is an original on a Macintosh," says Pinkwater.

How does he manage to make computer art look ancient and an ancient art seem modern? Pinkwater's secret is to start with a black screen and then use the multiple brush options in white to whittle away in the dark. "I didn't want to push for effects," he says, a trap many a novice *MacPaint*er falls into. "So I did less than I knew I could."

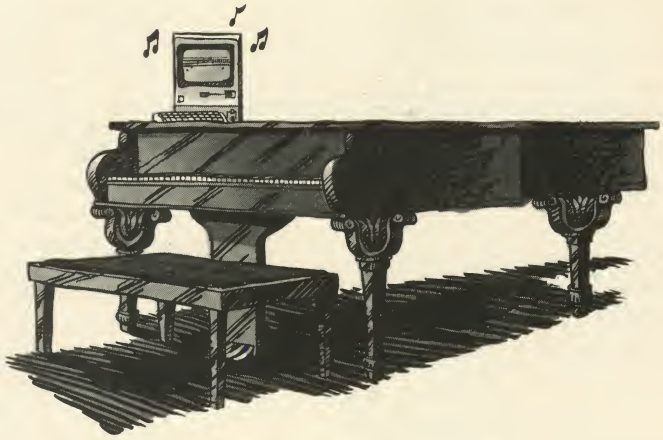
Being able to save a drawing in progress is a blessing for Pinkwater. "How many times does an artist say, "This looks good. I'm afraid I'm going to ruin it'?" he asks. It's a tremendous confidence builder to be able to take the same image a dozen different ways and back again without losing that first freshness.

"And I can save and work on a drawing until I run out of steam—even come down at 2:00 in the morning and pick up where I left off. No muss, no fuss, no cleanup." A feature previously found only in fine, no-wax floors.

The philosophy that pops up in all of Pinkwater's books is that the world is rich and full of wonderful things just waiting to be found. "I'd certainly include the Mac in that," says the "antiadult" Pinkwater. "The Macintosh is the best toy I've ever had.

"If it had wheels and I could drive it, that's all I'd want."

How to Mac Music



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You see, Professional Composer puts a blank piece of manuscript paper on your computer screen. Then it lets you use the Macintosh mouse, a small rolling box that controls a pointer on the screen, to enter clefs, notes, rests, time signatures and chords. Even ties, beams, slurs and note ornaments. In fact anything that would be part of a published score.

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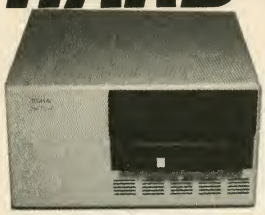
HARD & FAST—MAC DRIVES ON TO CONQUER SPACE AND SPEED



Kevin Goldstein

Once you've had the pleasure of using a hard disk with your personal computer, you're spoiled forever. With typical storage capacities of ten megabytes or better—the equivalent of twenty-five microfloppy disks—the floppy disk shuffle becomes an unmourned part of the past. Gone too are the long sonatas the floppy drive sang while it leisurely fetched your data: Hard disks are usually five to ten times faster than their floppy cousins and virtually noiseless. The only penalty all this goodness extracts is dollars from your wallet—hard disk drives cost three to six times as much as floppies, which is really not a bad deal considering they hold twenty-five times as much and operate five times faster.

With advantages like that, it's not surprising that Apple took steps early in the Macintosh development cycle to assure that hard disks would be available for Mac shortly after its introduction. Long before Apple's pride and joy was unveiled to the world, the company gave specs on the new machine to two of the top independent suppliers of hard disks for personal computers, Tecmar of Cleveland, Ohio, and Davong of Santa Clara, California. Apple's planning is paying off: Tecmar has just introduced a complete line of hard disks, and Davong's entries should debut in a few weeks. We'll review the Davong disk as soon as it becomes available.

Tecmar, in the meantime, has gone whole hog, introducing four different hard disk drives, all called MacDrive. The drive reviewed here is a five-megabyte cartridge drive—the cartridge looks just like a slightly overweight version of the standard Sony microfloppy. Don't let that superficial similarity fool you, though—the innards are totally different. Each five-megabyte replacement cartridge costs $120.

In addition to the single five-megabyte cartridge drive, Tecmar is also announcing a ten-megabyte fixed drive, plus two more drives that are combinations of the first two: a dual five-megabyte cartridge drive and a ten-megabyte fixed/five-megabyte cartridge drive. Both of the single-drive systems—the five-megabyte cartridge and ten-megabyte fixed—sell for $1,995; the dual-drive systems go for $3,250.

Mac Loves a Winchester

However advantageous hard disks are for the typical personal computer, they're even more desirable on the Mac, for two reasons. To begin with, the limited amount of memory in the Mac means that programs of any reasonable size will constantly be swapping parts of themselves (or data) in and out from the disk. With a floppy disk, that's a time-consuming operation. Worse yet, Mac's operating system consumes about 60 percent of the storage space on a floppy, which doesn't leave a whole lot of room for data. Simply going to double-sided disks would help a lot, since *all* of the additional 400K could go for data. With a capacious hard disk, the percentage of space taken by the operating system drops even more dramatically (about 5 percent of a five-megabyte drive).

There's another important reason why a hard disk is particularly desirable on a machine like the Mac, and it has to do with the fact that Mac's software parts are better integrated than the parts of most machines. You use that integration, for example, when you copy a picture from *MacPaint* into the Scrapbook and later paste that picture into a *MacWrite* document. The flip side of such integration, however, is that Mac needs almost constant access to the startup disk in order to keep all those features consistent between disks. That's why the Mac will frequently ask you to insert the startup disk when you're working with another disk.

With a hard disk, all those annoyances vanish. You now have *one* Scrapbook (which can be as large as you want it, limited only by the size of your hard disk), *one* Note Pad, *one* System. It's Mac as Mac was meant to be.

The five-megabyte cartridge drive reviewed for this article was almost, but not quite, the final version. There will be some differences between what is reviewed here and what you buy, which we'll point out as we go.

A Document Warehouse

The MacDrive itself is moderately bulky—its footprint is about the same as the Mac's—and it's only half as tall, but about as heavy. Installation is simple: Plug the nine-pin connector from the drive into the modem connector on the back of the Mac and plug in the power cord. That's it. The drive even comes with a "convenience" outlet so you can plug your Mac into it. (There's a connector on the back of the drive to plug your modem into, although that feature wasn't implemented on our test drive.)

Using the drive is almost as simple as installing it, although the first time you're likely to wonder just what the devil is going on. Push the white button on the front of the drive and the door opens a wee fraction of an inch. (Look carefully; it really has moved.) Open the door the rest of the way and insert the cartridge, then close the door and flip on the drive's power switch. Now insert the MacDrive System disk into the onboard Sony drive and turn the Mac on. (The Macintosh won't boot directly from the MacDrive.)

At about this time you're first going to wonder what's going on. When you turn on the Tecmar drive, nothing happens. At least, it looks like nothing's happening. In reality, the MacDrive is coming up to speed, although you won't know that unless you listen *closely*. Future versions of the drive will probably include a power-on light, so you won't have to wonder if your $2,000 baby took a walk. In any case, in about fifteen or twenty seconds the drive will come up to speed, and the red light on the front will finally wake up and blink at you.

The Mac, in the meantime, has been booting the MacDrive System disk, and pretty soon you'll see its icon on the desktop. That's all you'll see for a few moments, and again you'll have enough time to wonder if your hard disk is alive and well. Be patient. You might not know it, but the hard disk is in the process of being installed. After a few more seconds you'll see the watch icon, telling you to wait, after which the hard disk icon will appear.

From that point on, you treat the hard disk pretty much as if it were a floppy, albeit a floppy with five or ten megabytes of storage. Copy files to it, run programs from it, enjoy.

The first time you run a program off the hard disk, you may be quite pleased with its faster speed—it's two to three times faster than a floppy. Saves in *MacWrite* go much faster, dropping from an annoyingly long delay to an acceptably short one. Using the hand in *MacPaint* to view different portions of the page is equally satisfying, as the screen is now repainted at a brisk rate that's actually fun to watch.

Despite that performance, if you've used a hard disk on another computer, you may be somewhat disappointed. As mentioned earlier, hard disks are generally five to ten times faster than their floppy counterparts; in comparison to that, the Tecmar drive isn't quite up to par.

That situation could change significantly by the time you read this. While it's true that most hard disks use a parallel interface to connect to the computer—a connection that can transfer data more than ten times faster than the serial connection used on the Mac—the serial bottleneck, although the most obvious, accounts for only a portion of the slowdown. Another significant drag on performance can be traced to the fact that, because the Mac has so little memory, applications programs frequently overwrite the disk directory in memory. That means that every time the Mac needs to get data from the disk,

it must first fetch the directory, then go back and fetch the data. That extra access can almost double the time it takes to perform a disk operation.

To make up for Mac's memory limitations, Tecmar stuffed a microprocessor and sixty-four kilobytes of memory right into the disk drive. That memory can be used to hold the directory, thereby making that information instantly available to the Mac when it needs to read or write a file. Memory used like that is called *cache memory*; loading the directory into cache memory can speed up disk operations dramatically.

Tecmar hadn't implemented the cache feature at the time of this review, but all that's required is a new version of their MacDrive System disk—the hardware won't change. A speedier version implementing cache should be available by the time you read this. A further contribution to speed is likely to come this summer from Apple, when the company releases a new version of the Finder optimized for use with high-capacity hard disks. Taken together, those improvements could power the drive to a speed five times that of floppies.

With any luck, that new version of the Finder will also take care of one particularly annoying aspect of using MacDrive. As it now stands, the only way to get the Mac to change the system drive from the startup disk (MacDrive System) to the hard disk is to run an application off of the hard disk and then exit the application. After that, you can eject and trash the startup disk and the hard disk will become the system drive. That's awkward; a "change system drive" option in the Special menu would make life much easier. Until then, the best we can hope for is a dummy program from Tecmar that opens and closes itself really fast.

A Walk through the Drive

Although hard disks and floppy disks share the same basic principles of operation, the details vary significantly between the two. In a floppy disk, a read-write head similar in concept to that found in an audiotape recorder rides directly on the spinning magnetic media; a pad opposite the head gently pushes the disk into contact with the head. That method is very similar to what happens in a tape recorder, where the tape is dragged past the audio read-write heads.

The amount of information you can encode onto a magnetic surface depends directly on how fast the magnetic surface is moving past the head (or the head is moving past the magnetic surface): The faster the magnetic media moves, the more data can be crammed into each linear inch. You need movement to create electric/magnetic fields; the faster the movement, the stronger the field, which accounts for the greater amount of data. That's why studio-quality professional tape recorders operate at 15 inches per second, while home cassette decks can get by with a snaillike 1 7/8 inches per second. Video decks, which need to store huge amounts of information, not only move the tape past the heads, they actually spin the head to gain even more relative motion between the tape and head.

The same goes for disks—the faster you spin them, the more data you can cram into each inch. But as long as you're keeping the head in contact with the media, there's a limit to how fast you can spin it before some small irregularity (like a piece of dust) slices through the head, the media, or both. For reasonable head and media life, floppy disks are limited to about three hundred revolutions per minute.

If you could move the head just slightly away from the surface of the media, you could spin it much faster. Try to do that with a floppy disk, though, and you run into a problem: Because the disk isn't rigid, parts of it will be farther away from the head than other parts (sort of like an instant warped record). But moving the head just a little bit away from the media causes the output signal (the strength of the electrical signal representing the data) to drop a whole lot, and you end up not being able to read your disk very reliably (if at all).

The obvious answer is to deposit the magnetic coating onto a nonwarpable, or rigid, plate, which is exactly what is done in a rigid disk. (Now you know where they get the name *hard disk*. The name *Winchester* is a holdover from the nickname bestowed upon the first hard disk, which was invented by IBM. That disk had thirty megabytes of fixed storage and thirty megabytes of backup, and everybody knows that a .30/30 is a Winchester.) Now, because the closer you can get the heads to the rigid platter without actually touching it, the stronger the signal, you've still got to figure out how to mount the heads so they remain between ten and twenty millionths of an inch above the disk.

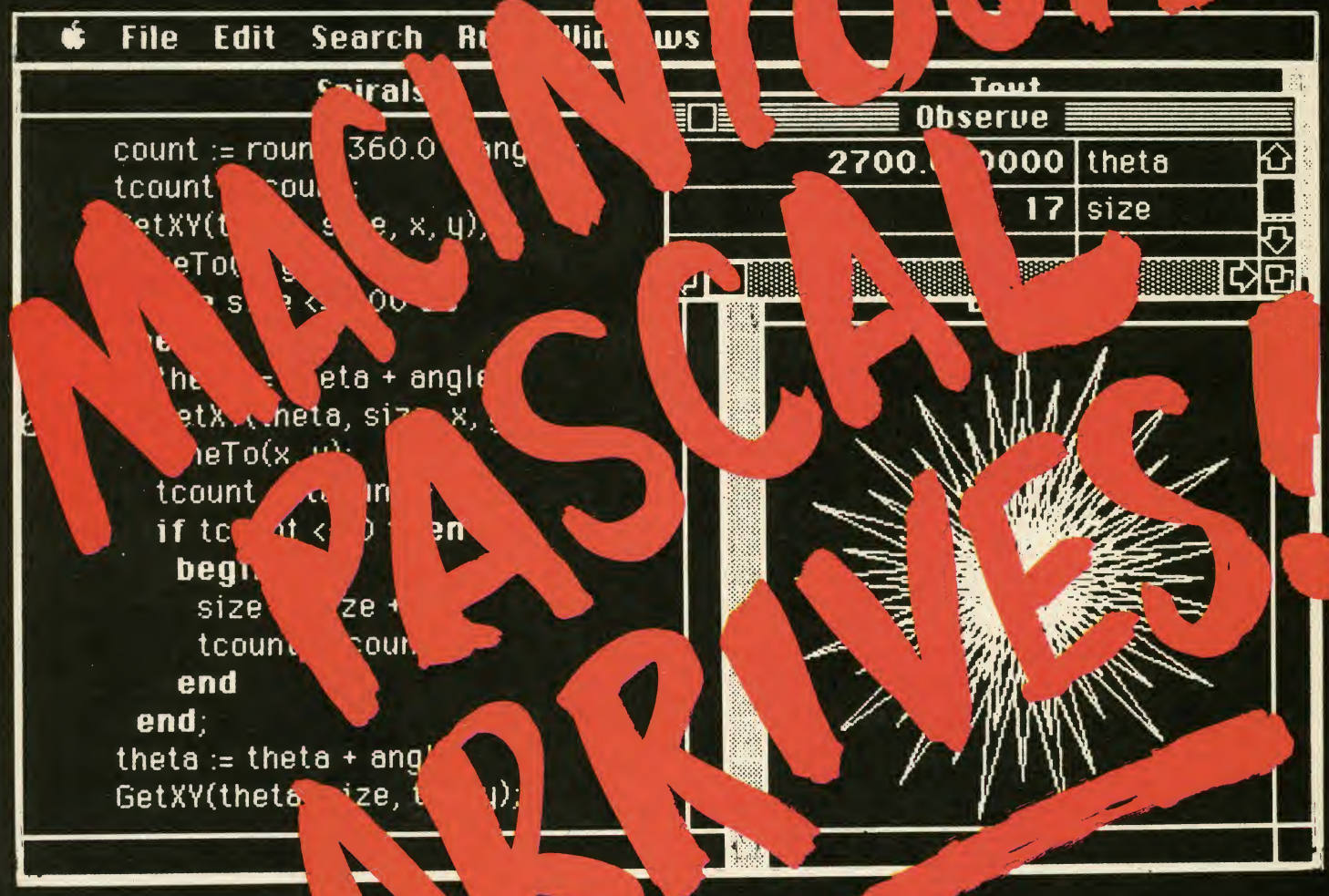
Easy. Spin the rigid plate—called, logically enough, a platter—so fast that it drags a small layer of air around above it, much like the earth pulls the lower atmosphere around with it (creating winds, weather, and climate in the process). Now just put teeny little wings on your head, and...presto...it will fly just a wee bit above the actual surface of the disk. Close, but not so close that it touches. If you've ever heard the term "head crash," you now know not only what it means, but just how descriptive the term really is: For whatever reason—the disk being jarred, for example—the flying head literally crashes into the surface of the disk. The result is a gouge in the platter and a badly damaged drive.

As a matter of fact, the heads fly so close to the platter in a hard disk that even a speck of dust looms like a boulder, and a stray microscopic piece of metal could easily cause a head crash. To prevent such catastrophes, hard disks are assembled in clean rooms and hermetically sealed at the factory; just in case any dust is still around hoping to jump on the merry-go-round, the air within the sealed drive is constantly being sucked through a very fine filter.

In addition to allowing more bits to be packed into each inch, spinning the disk faster means the bits will be read off the disk faster. Indeed, typical data transfer rates for a floppy disk run five hundred kilobits per second, whereas a hard disk transfers data ten times faster, or five megabits per second. (High-performance Winchester disks are faster yet.)

Since the typical hard disk interface transfers data at five megabits per second, but the Mac can only accept data through its serial port at about one megabit (actually seven hundred to eight hundred kilobits in real life), some kind of buffering is needed between the disk and the Mac. That's why Tecmar uses a 68008 microprocessor with its own memory in the MacDrive.

Tecmar gets double and triple use out of that processor. In addition to providing the intelligence necessary to make possible both data buffering and the directory caching mentioned above, the onboard 68008 can supply the intelligence needed to connect the system to AppleBus, Apple's small networking system. Tecmar's choice of the 68008 microprocessor, which is a variant of the 68000 found in the Mac, was a clever one. The 68008 runs the exact same code as the 68000; the only difference lies in its interface to the outside world, where it uses an eight-bit bus, or interface, versus the 68000's sixteen-bit bus. That means the drive itself can directly run the AppleBus code written for the Mac, assuming that Apple grants Tecmar a license to do so. Upgrading current MacDrives to run AppleBus may be as simple as a software change (meaning a new MacDrive startup disk) or may require replacing some read-only memories, a simple operation that can be done by your dealer in a few minutes. AppleBus will slow things down slightly—it transfers data at 240 kilobits per second, versus the 700- to 800-kilobit-per-second rate of an unshared MacDrive. In return, many Macs—or any machine that can run AppleBus, for that matter—will be able to share the MacDrive.—Kevin Goldstein



MACINTOSH PASCAL ARRIVES!

Bruce F. Webster

A WINDOW ON PASCAL

A New Interpretation of an Old Language

He's an outstanding programmer with two very successful software packages out on the market. He's preferred programming in assembly, having little interest in (or love for) high-level languages. That is, until now. You see, the other day he spent about twenty minutes watching a programmer use Macintosh Pascal. He liked the automatic formatting and keyword detection. He was pleased with the quick syntax scan and error indication. He nodded approvingly at the interpretive change-and-go environment. He was surprised by the trace and pause functions. But when he saw the programmer insert breakpoints, set up the Observe window, and watch the variables change as the program ran, he said, "How soon will this be out on the market? I want to buy it!"

Well, by the time you read this, Macintosh Pascal should be out on the market, or at least very close to release. And no matter what you think of Pascal, you should give this package a good, hard look. Developed by Think Technologies and distributed by Apple, Macintosh Pascal represents a new generation of programming languages. It's not just another compiler; in fact, it's not a compiler at all. MacPascal is interpreted, much like Basic. In other words, you don't have to recompile your program each time you modify it; you just change it and go. What's more, you can stop the program, look at the variables (and even change them), then continue the program.

But we're getting ahead of ourselves. Suppose you've just bought MacPascal, and you want to put it to work. Where (and how) do you begin? Let's go through a hypothetical programming session and look at the elements of MacPascal. If you already have bought the language, you may want to do the things we're talking about. Otherwise, just read: Try to extract the flavor of MacPascal. Even if you know how to program but have never used Pascal, you'll be able to appreciate the editing and debugging features described later in the article.

House of Many Windows

When you first run MacPascal, you get the display in figure 1: the menu bar and three windows. The Untitled window is where our program will go. In fact, it has a small dummy program already in it. It has the standard window parts: a size box, to change the window's size; scroll bars, for moving through the program; a control bar, for moving the window around the screen; and a close box, for hiding the window completely. The other two windows, Text and Drawing, can also be resized, moved around, or hidden completely. The Text window is where any text input and output will take place; any graphics work will show up in the Drawing window.

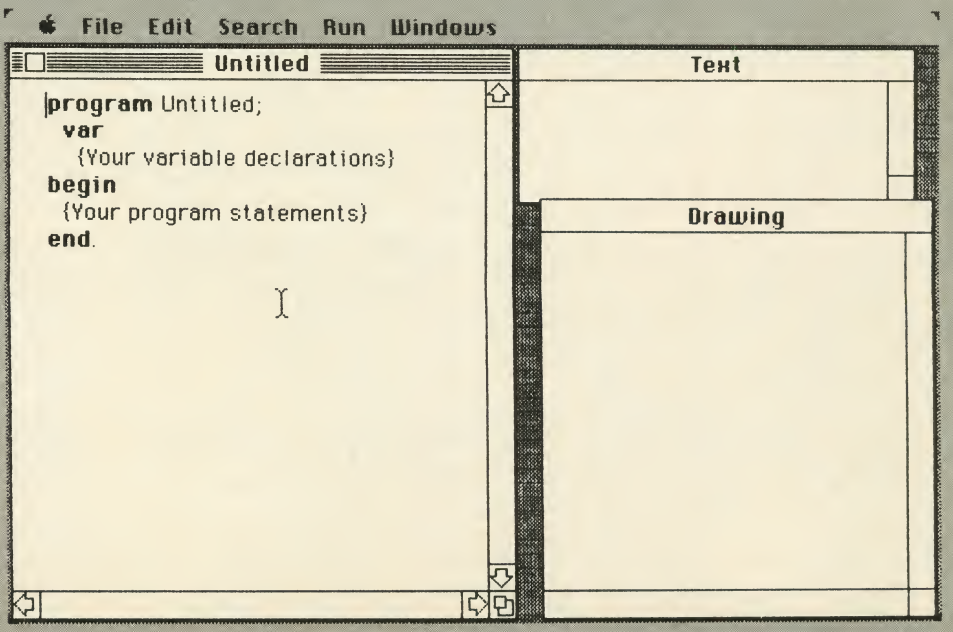
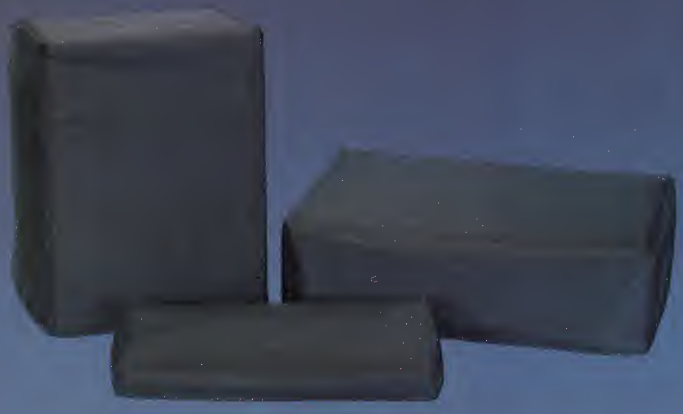
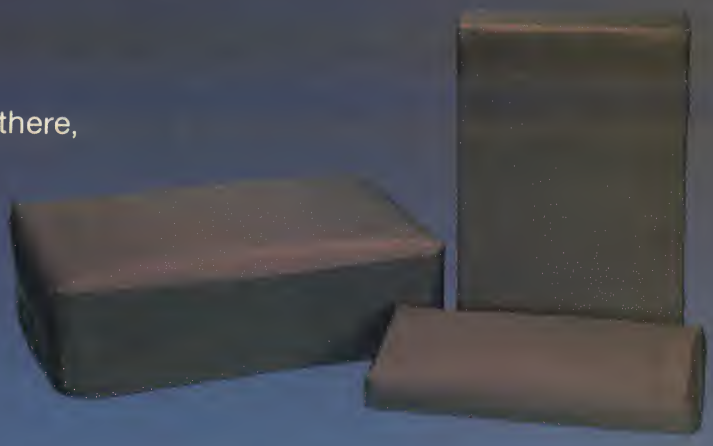


Figure 1.

COVER UP

You've taken that step into the computer age, stay there, by protecting your computer from the elements.





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Back to the Untitled window. MacPascal uses the standard *MacWrite* editing features—cut, copy, paste, undo—selected from a pretty standard Edit menu. For example, let's change the title of the program from "Untitled" to "Spirals." Select the word *Untitled* by dragging the mouse from one end of it to the other and type *Spirals*. As you do so, *Untitled* will disappear and *Spirals* will take its place, just as it would in *MacWrite*. In the same way, select the line that says {*Your variable declarations*} and type *angle:integer;* (note the semicolon at the end). Now replace the line {*Your program statements*} with *PenMode(PatCopy); PenSize(1,1); GetAngle(angle); DrawSpiral (angle);*. As you type this, MacPascal automatically formats the program for you, putting each statement on a new line, as shown in figure 2. If you have MacPascal and you're typing these lines in, the figure shows what your Untitled window should look like now.

PenMode and PenSize are QuickDraw routines that determine how the graphics pen will draw in the Drawing window. These are already defined in MacPascal, so you don't have to do anything about them. We'll have to enter the other two routines, GetAngle and DrawSpiral, called by the program. For starters, let's do the GetAngle procedure. To get more room to edit in, point the cursor at Untitled's size box (lower right corner) and drag it to the right until the edge of the window is an inch or two from the right edge of the screen. Move the cursor to the end of the line *angle:integer;*, click the button, and hit return. Now type the following:

```
procedure GetAngle(var
   angle:integer);
begin
repeat write('Enter angle: ');
   readln(angle) until angle > 0
end; { of proc GetAngle }
```

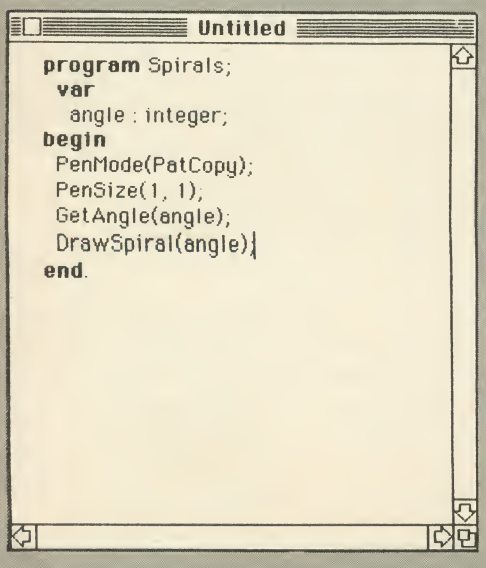


Figure 2.

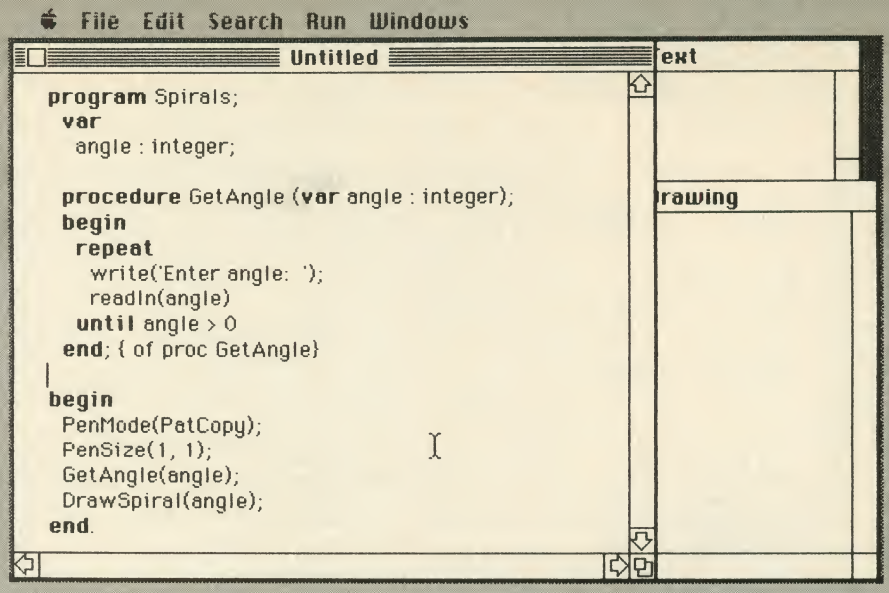


Figure 3.

Hit return again when you're done. Your screen should now look like figure 3. When your program runs, this routine will write the string *Enter angle:* out to the Text window and will read the number you type in. It will do this until the number you enter is greater than 0.

Now that you're feeling comfortable with how MacPascal works, you can enter in the rest of the program. Move the cursor to the blank line after *end; {of proc GetAngle}*, click it, and type in the following:

```
procedure GetXY(theta : real;
   size : integer; var x,y : integer);
const cx = 100; cy = 100;
   two_pi = 6.253185308;
begin
theta := two_pi*theta/360.0;
x := cx + round(size * cos(theta));
y := cy + round(size * sin(theta));
end; { of proc GetXY }
```

Again, you'll see MacPascal nicely format the code as you enter it. By the way, if you type anything incorrectly in such a way that MacPascal can't interpret it, the formatting routines will immediately outline the parts it doesn't understand. This routine is just a polar-to-rectangular coordinate conversion routine. It takes an angle (theta—in degrees) and a distance (size) and returns the coordinates (x,y) of the point at that angle and distance from (cx,cy).

You've got one more routine to enter—DrawSpiral—and it's the longest one, so go slowly and carefully:

```
procedure DrawSpiral(angle :
   integer);
var theta : real; x, y, tx, ty :
   integer; size, count, tcount : integer;
begin
EraseRect(0,0,600,600);
size := 1;
theta := 0.0;
count := round(360.0/angle);
tcount := count;
GetXY(theta,size,x,y);
MoveTo(x,y);
while size <= 100 do begin
theta := theta + angle;
GetXY(theta,size,x,y);
LineTo(x,y);
tcount := tcount - 1;
if tcount <= 0 then begin
size := size + 2;
tcount := tcount end end;
theta := theta + angle;
GetXY(theta,size,tx,ty);
x := (x+tx) div 2;
y := (y+ty) div 2;
LineTo(x,y)
end; { of proc DrawSpiral }
```

When you're all done, go up to the File menu and select the Save As option. When it asks you for a file name, type *Spirals* and hit return. Your program is now saved on the disk. It's a good idea to go back and use the Save option from time to time while you're debugging a program, just to make sure your most recent version is out on the disk.

Take Her Out for a Spin

So far, this hasn't been much different from a session on *MacWrite*. (And why should it be? Just because program editing is harder than word processing on most machines is no reason why it has to be on the Macintosh.) The only difference has been the automatic formatting that MacPascal does when you finish typing each line of code. Now comes the fun part: running your program. Here we'll see why MacPascal is unique among programming languages.

First, change the size of the program window (which should now be named *Spirals*) until the Text and Drawing windows are completely visible. Next, go to the Run menu and

Figure 4.

select the Check option (see figure 4). This will scan your program, looking for errors. If you faithfully entered the program, you will have no errors. If you do have an error, most likely you mistyped some name. A hand pointer will indicate the line on which the error appears. Acknowledge the error by moving the cursor into the error box and clicking the mouse. Then look at the statement where the blinking cursor is and check for the problem. When you've corrected it, run Check again and continue the process until you get no errors. Check tends to discover errors that the automatic checking (performed when the line is entered) would miss because Check is able to look at the program as a whole.

Your program is now ready to run. Go back to the Run menu and this time select the option Go. A couple of things will happen. First, the menu bar will change. A new menu, Pause, will appear at the end, and all the other menus will be disabled. Next, the prompt *Enter angle:* will appear in the Text window. Type in some value—say, 170—and hit return. Down in the Drawing window a pretty geometric shape will grow before your very eyes. Once it's done, the Pause menu will disappear and the others will be enabled (see figure 5). Try it again, entering different values, and see what shapes you get. Be warned, though: The smaller the angle, the longer the shape will take to draw.

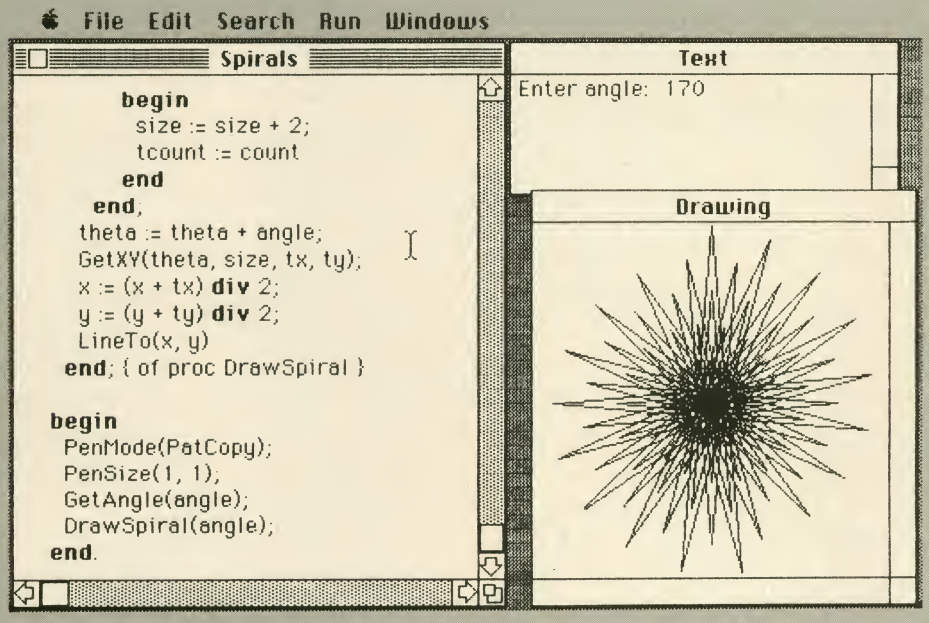


Figure 5.

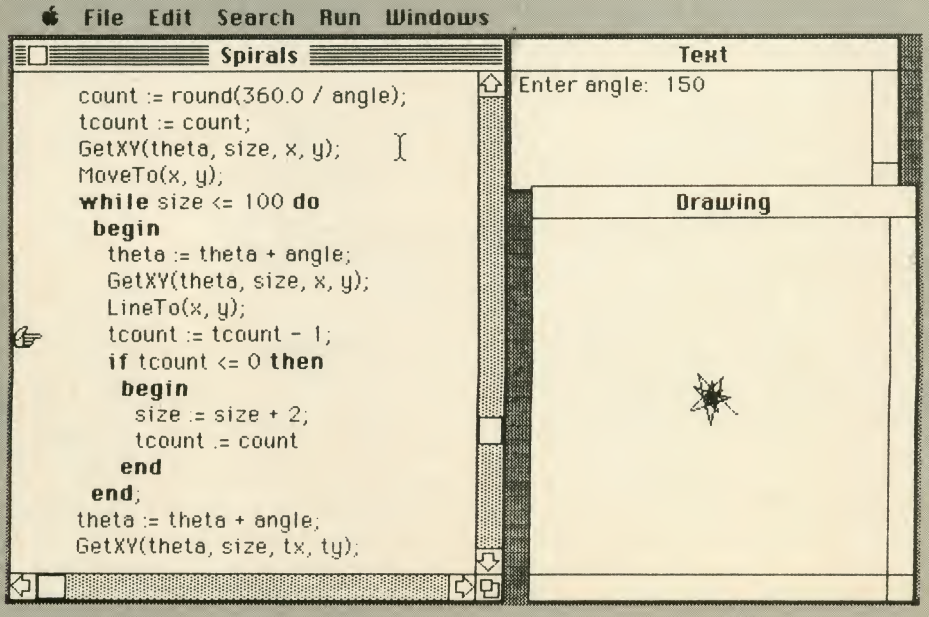


Figure 6.

Stop-and-Go Driving

Now for a little fun with MacPascal's interactive debugging features. Start the program again and enter a value for the angle. As soon as the shape starts drawing, open the Pause menu and select the Halt option. Your program will stop, with a little finger pointing at the statement that was about to be executed before you halted things, as shown in figure 6. Now type Command-S. The finger moves to the next statement. Continue to type Command-S and your program will run, line by line, until you stop or the program finishes. If you want, you can go up to the Run menu and select the Step-Step option. Now, your program will execute on its own, but it will continue to point to each statement as it is executed. It's a shame we can't show you this happening in the pages of the magazine: It's an instant education in how program flow works.

When your program is done, restart it and then halt it again once it starts drawing. Now open the Windows menu and select Observe. The Observe window will appear over the Text window. Type *theta*, hit return, and type *size*. Use the scroll box on the side of the Observe window to scroll both *theta* and *size* into view (or just make the Observe window larger). Now start stepping through your program by typing Command-S. As you do, the values of theta and size will appear in front of their names in the Observe window, changing as they change in the program (see figure 7). So, now you can not only step through your program, you can also monitor selected variables as you do so.

If you're trying these things out as we talk about them, you may have noticed that stepping through the program can get tedious after a while. Wouldn't it be nice if your program would run by itself most of the time, but would automatically stop at key points? Guess what? It can!

Let's say you want to see what values theta and size have each time that size is increased (the statement *size := size+2* in DrawSpiral). Scroll the program window (Spirals) until that statement is visible. Now go up to the Run menu and select the Stops In option. You'll see a new column appear to the left of your program. If you move the cursor into that column, you'll find that it turns into a little stop sign. Move the sign so that it's in front of the statement *size := size+2* and click the mouse button. Presto! You've put a stop sign there.

Now run the program (Command-G will do the job). The program will run until it hits that statement, at which point it will stop. The pointing finger will appear on top of the stop sign, as shown in figure 8. If you still have the Observe window up, the current values of theta and size will be displayed. If you type Command-G again, the program will continue until it hits the stop again, and so on. You've got one more option. If you just want your program to pause at each stop sign, go into the Run menu and select the Go-Go option. Now, your program will halt momentarily when it hits the stop sign, update the Observe window, and then continue. Pretty nifty, huh?

Instant Gratification

One last option and we'll wrap up our tour of MacPascal. Suppose that you want to change directly the value of some of your variables while your program is executing? Suppose you want to change the value of the variable *angle* after *size* got above a certain value, say, 50. Run your program with the stop and the Observe window, typing Command-G each time the program stops until size equals 50 (hint: Choose a large angle—you'll get there more quickly). Now, go up to the Windows menu and choose the Instant option. Lo and behold, a new window! The Instant window allows you to execute any statement at any time. Type the statement *angle := angle div 2;* as shown in figure 9, then click the Do It button. Now, continue your program with Command-G or Go-Go or whatever. See the difference in the spiral being created?

If It's July, This Must Be Pascal

The tour has been a lengthy one, but in some respects we've just scratched the surface. For example, we haven't even begun to talk about the QuickDraw routines and how to use them, nor about the various extensions to the standard Pascal definition. What we have seen is this: Macintosh Pascal is unlike any other software development package available on micros today. It promises to be an excellent tool for learning programming, in both secondary schools and colleges. What's more, MacPascal is closely compatible with Lisa Pascal, which is currently the primary development language for the Macintosh. This means that developers could use it to quickly design and test sections of code, which they could then transport back up into Lisa Pascal. Because of this, MacPascal will probably become one of the more popular software packages for the Macintosh. If you have any interest in programming on the Mac, consider this package, even if you've never considered Pascal before.

MacPascal
Think Technologies
420 Bedford Street
Lexington, MA 02173
(617) 863-5590
$124.95

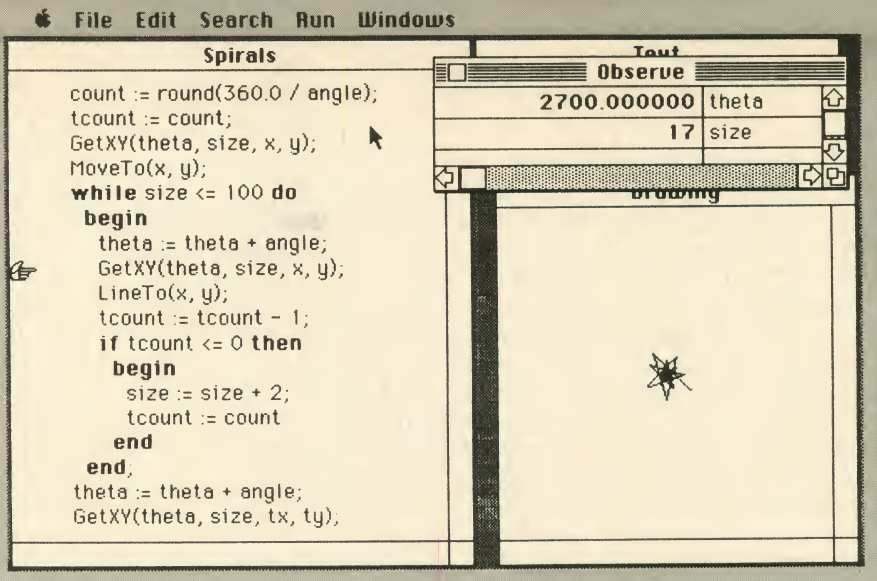


Figure 7.

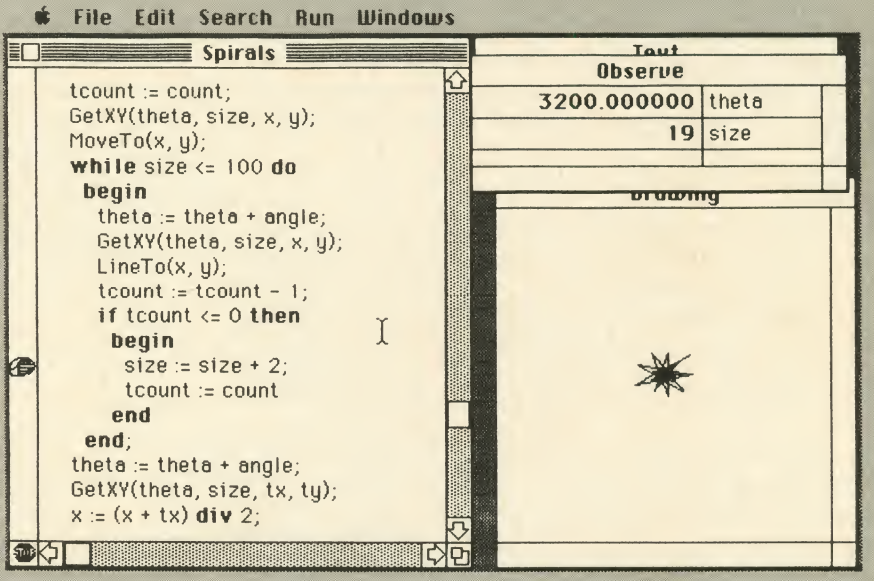


Figure 8.

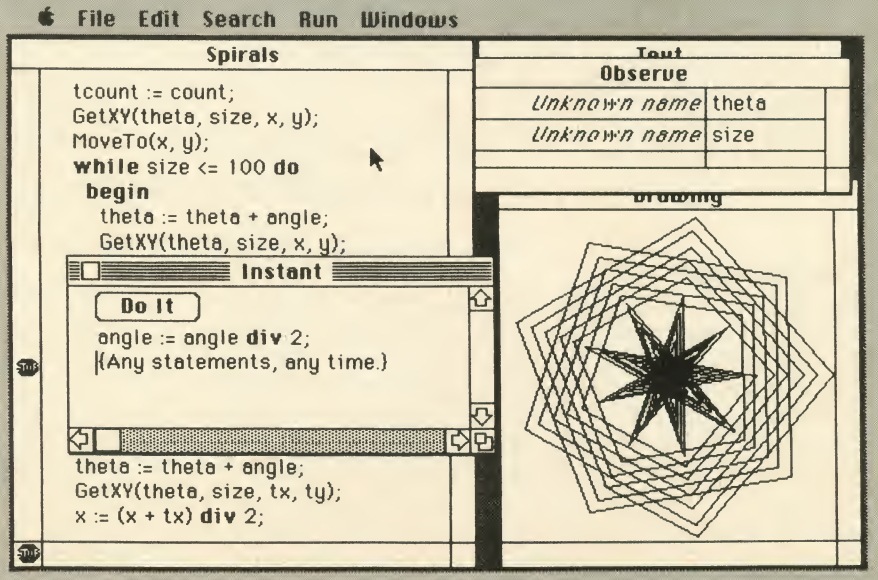


Figure 9.

By STEVE LAMBERT

The Macintosh, with its high-resolution bit-mapped screen and ability to manipulate data rapidly, has made possible a whole new family of text and picture processors that offer true "what you see is what you get" capability. For many applications, the Imagewriter's sharp reproductions of text and graphics created on the Macintosh are adequate; there are times, however, when your documents require even more polish than your Apple can provide.

During the past few years many people have discovered how cost-effective it can be to use their personal computers to create documents that they'll ultimately have typeset, printed, and distributed. The Macintosh as it exists now is not capable of replacing a typesetting machine, but it does have tremendous potential as the machine for creating files to send to the typesetter.

Recognizing this fact, several companies have developed, or are in various stages of developing, programs that allow you to use the special features of the Macintosh to create and edit a document, test for proper line and page breaks, integrate text and graphics, and visually implement variations in typeface and size—all before sending it to the typographer for final refinement.

This article will provide an overview of the mechanics of typesetting, discuss where the Macintosh can fit in, and introduce several companies that offer various typesetting services to those of us with Macintosh computers.

Why Typeset?

When text is set in type, the size and shape of each character can be specified; so can the spacing between characters and lines, as well as the length and location of each line. Personal control, combined with the fact that typeset text is crisper (and therefore more readable in small sizes than typewritten text), allows you to present your information more aesthetically in less space. A 50 percent reduction in the space required is typical; 35 to 70 percent is the normal range.

A savings of space becomes a savings in money when you print and distribute information. A report released in 1983 by the Rand Corporation compared the cost of printing and mailing 1,000 copies of a 200-page typewritten document to the cost of printing and mailing the same number of copies of a typeset version of the same document. Printing the 200-page document would have cost $2,220. The typeset document, which was only 100 pages long, could have been printed for $1,090—a savings of $1,130. First-class postage on the 200-page document would have been $2.50 per document, as opposed to $1.45 for the typeset version—a savings of $1.05 per document, or a total of $1,050 for 1,000 copies. The total savings on the entire project would have been $2,180.

Typesetting a 200-page document may cost you anything from several hundred to a thousand dollars, depending on how intimately you want to participate in the process of converting your ideas into typeset text.

How Can You Participate?

Before the Macintosh, participation in the typesetting process usually meant learning some basic typesetting commands and inserting them in your document at the appropriate places. These commands are intercepted by the computer that controls the typesetter (usually called the "front end"), combined with codes entered by the typographer, and used to format your document.

The number and variety of commands required depends on the complexity of the job; a typical typesetting job may require only ten or twelve different commands but will use each command many times. One or more commands are required to change the flow or style of your text. For example, a command is required to change to an italic font, and another is required to change back.

If you are currently using a word processing program, such as *WordStar*, that displays its formatting commands on the screen, then you're familiar with this process. Typesetting is the same thing, only more of it. A sample *WordStar* document, as it looks on the screen and as it appears when printed, is shown in figures 1a and 1b.

If this sample were part of a document you were sending to the typesetter, you would have to replace *WordStar*'s format commands with commands the typesetter's front end could understand (a few typographers do have programs that translate *WordStar* commands directly). There are many systems of typesetting commands; a typical one would use commands similar to those shown in figure 2a. The front end would interpret and expand these commands, insert a few additional commands that the typographer had specified for the document, and send a file similar to figure 2b to the typesetter.

Your typeset sample, looking like figure 2c, would be produced on special paper ideally suited to photoreproduction.

Notice the differences between the sample as it appears on the computer screen and on the typeset page. Even if it were possible to duplicate the embedded formatting commands, it would be impossible to simulate the output of the typesetter on a conventional computer screen. To begin with, most computer screens display text in precisely defined rows and columns—typically eighty columns by twenty-four rows. The typeface that appears on the screen is known as a monospaced font, because each letter occupies exactly the same

```
^BWordStar^T(tm)^T^B is a very ^Qpopular^Q and powerful
word processor, capable of applying a variety of formats to
text. Each format has a code that appears on the screen to
tell you how the printed output will appear.
```

Figure 1a. A sample WordStar *document as it appears on-screen.*

WordStar (tm) is a very *popular* and powerful word processor, capable of applying a variety of formats to text. Each format has a code that appears on the screen to tell you how the printed output will appear.

Figure 1b. The same WordStar *document printed out.*

```
I)<FB>WordStar$TM<FR> is a very <FI>popular<FR> and powerful
word processor, capable of applying a variety of formats to
text. Each format has a code that appears on the screen to
tell you how the printed output will appear.
```

Figure 2a. Typical typesetting commands.

```
<CF10><CL12><CC30><AH><XL><KO><CS3,4,3>
<IF1.6><EP><AF><CFTRB>WordStar$TM<CFTR> is a very
<CFTRI>popular<CFTR> and powerful word processor, capable of
applying a variety of formats to text. Each format has a
code that appears on the screen to tell you how the printed
output will appear.<EP>
```

Figure 2b. A typical file as received by the typesetter.

WordStar™ is a very *popular* and powerful word processor, capable of applying a variety of formats to text. Each format has a code that appears on the screen to tell you how the printed output will appear.

Figure 2c. The typeset sample.

Steve Lambert is the author of Presentation Graphics on the Apple Macintosh, *from Microsoft Press.*

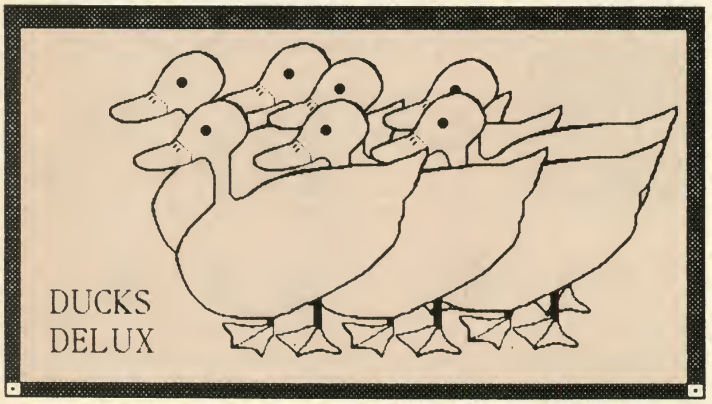
GET SET

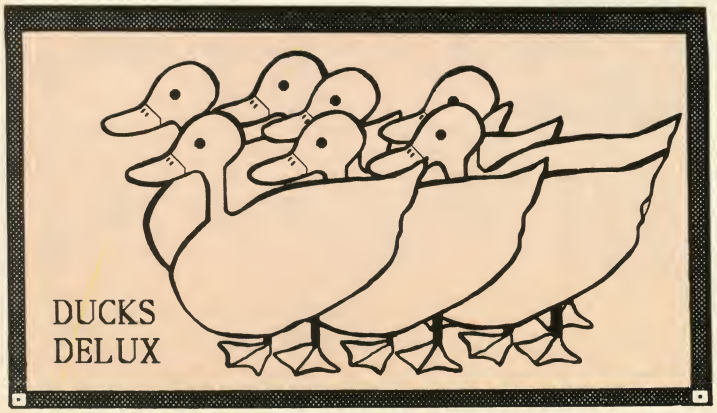
MAC'S WORDS AND PICTURES GO PRO

amount of space. Most typeset text uses proportionally spaced fonts that allocate more space to wide letters than to narrow ones. As a result, few personal computer/word processing packages allow you to see an accurate preview of your text as it will appear when typeset. (Microsoft's *Word* on the IBM probably comes closest.)

How Is Typesetting from the Macintosh Different?

You could go through the same steps on the Macintosh as outlined above; obviously, there would be no *WordStar* commands, but the embedded typesetting commands could be the same. You could then telecommunicate your document to a typesetter and have it treated as if it had come from any other computer. You could do this, but you certainly wouldn't be taking advantage of the capabilities of the Macintosh if you did.





One of the beauties of the Macintosh is its ability to display on the screen a variety of fonts in various sizes. Although these fonts don't correspond exactly to conventional typesetting fonts, they are close enough to give you a feel for the real thing. And, with the exception of the Monaco font, all are proportionally spaced and are displayed as such on the screen.

By carefully choosing the typeface and size and setting the margins properly, you can simulate on the Macintosh screen (and therefore on the Imagewriter) the design and layout of your document. Figure 3 shows the paragraph you are now reading as it appears on the Macintosh screen.

> By carefully choosing the typeface and size and setting the margins properly, you can simulate on the Macintosh screen (and therefore on the Imagewriter) the design and layout of your document. Figure 3 shows the paragraph you are now reading as it appears on the Macintosh screen.

Figure 3. Text as it appears on the Macintosh screen.

Although the ability to simulate typeset output on-screen may not be particularly important to you if the primary product of your word processor is interoffice memos, people who produce quality books and documentation spend a lot of time worrying about where every letter will appear. They don't like consecutive lines that start or end with the same word (stacks), paragraphs that end with a very short line (widows), or white space that runs through the text (rivers of white). Unless you can preview the text as it will be typeset, you can't catch these problems until you receive first galleys (the product of the first pass through the typesetter). Correcting these problems on first galleys means time and money.

So the first big change brought about by typesetting from the Macintosh is the ability to preview text layout.

The second big change is that, because the Macintosh is such an obvious typesetting tool, typographers are teaming up with programmers to produce interfaces that translate Macintosh formatting codes directly into typesetting codes, thereby freeing you from the task of having to embed strange symbols in your document.

The third change is the ability to send graphic images produced on the Macintosh screen, with programs such as *MacPaint* and Microsoft's *Chart*, directly to the typesetter. Due to the typesetter's higher resolution (typically more than 1,000 dots per inch compared to the Imagewriter's 72), the typeset image is much crisper and reproduces better than that from the Imagewriter. The accompanying examples illustrate the difference.

Now that you have a general idea of where the Macintosh fits into the typesetting picture, let's meet a few of the companies providing typesetting products and services. All are currently working on additional products; feel free to contact them directly for more information.

George Lithograph Company

George Litho received an early indoctrination into computer technology in 1970. This company typeset the training manuals for Apple and other computer companies in the Silicon Valley.

While working at integrating Imagewriter-produced graphics into the Lisa manual, they suggested interfacing the Lisa directly to their APS-5 Autologic typesetter to create higher-quality illustrations. The idea took, but it wasn't implemented until the Macintosh project, when Apple provided a software package to convert a *MacPaint* file to a compressed ASCII format and transmit it to the DEC minicomputer that serves as the front end to the APS-5 typesetter.

From the DEC the image file can be sent to either the digital typesetter and reproduced at a density of 720 pixels per inch or to an HP 2700 laser printer, which reproduces it at 300 pixels per inch.

Neither of these methods provides more *resolution* than the Imagewriter's seventy-two pixels per inch (each just uses multiple pixels to create each Macintosh pixel), but both provide more *definition*.

Typesetting one *MacPaint* page currently takes about 8.3 minutes (compared to 20 to 30 seconds for a typical page of text). The charge for this service is $22 per page for printing-quality output and $6 per page for laser print on bond paper, plus $20 per disk (twenty-five to fifty-five pages will fit on one disk).

George Litho is currently typesetting about fifty *MacPaint* pages a day. If the demand for this service continues to increase, the system will be modified to reduce the time per page to about one minute, which should lower the price somewhat.

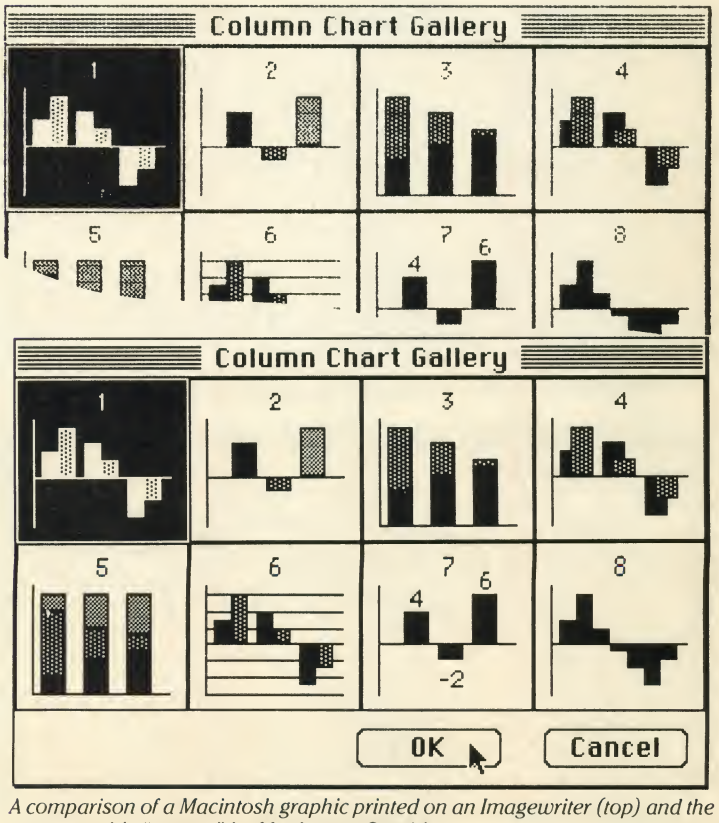
The laser printer output currently takes about as long and costs $6 per page, with the same $20 charge per disk handled.

For additional information, contact Erica Austin or Gina Vanlue at George Lithograph Company, Box 77085X, San Francisco, CA 94107; (415) 397-2400.

Manhattan Graphics

Manhattan Graphics has written a Microsoft Basic program that converts the bit-mapped image stored in a Macintosh *MacPaint* file to a form of compressed ASCII that can be transferred to the ten-megabyte hard disk of the MCS (Modular Composition System) unit that serves as the front end of the company's Compugraphic 8400 typesetting system.

Once in the MCS, the graphic can be integrated with text that has been prepared for typesetting and stored in the system. An entire page, including text and graphics, can be previewed on a monitor. Editorial and artwork changes can be made and the graphic can be properly positioned on the page. Once everything is properly arranged, the file is passed on to the Compugraphic digital phototypesetting unit and typeset at the rate of about one page every ten minutes. The



A comparison of a Macintosh graphic printed on an Imagewriter (top) and the same graphic "typeset" by Manhattan Graphics.

current charge for this service is $30 per *MacPaint* page, with no charge for disk handling.

Ken Abbott, president of Manhattan Graphics, feels that the real power of the Macintosh is as a front end to sophisticated typesetting systems such as his. Manhattan Graphics has developed a program that allows this to be done, to some extent, with *MacWrite* on the Macintosh, and the company is working on a more sophisticated version using Microsoft's *Word*. This program will allow anybody with access to a Macintosh and *Word* to create and edit documents and then send them directly into a typesetter. The typesetter, using a companion program also developed by Manhattan Graphics, converts the Macintosh fonts to those available in its library, translates all formatting codes, and sets the text. When a graphic is encountered, it shifts to a bit-mapped mode and sets that also.

Manhattan Graphics will typeset *MacWrite* documents for $10 per page, with a setup fee of $50 per job to cover the creation of the necessary translation table.

Companies that have in-house typesetting equipment can pay a one-time license fee and obtain the companion program that runs on their typesetting system. The fee for either of the two companion programs (for *MacPaint* and *MacWrite*) is $2,500, with a 30 percent discount on the second if both are acquired.

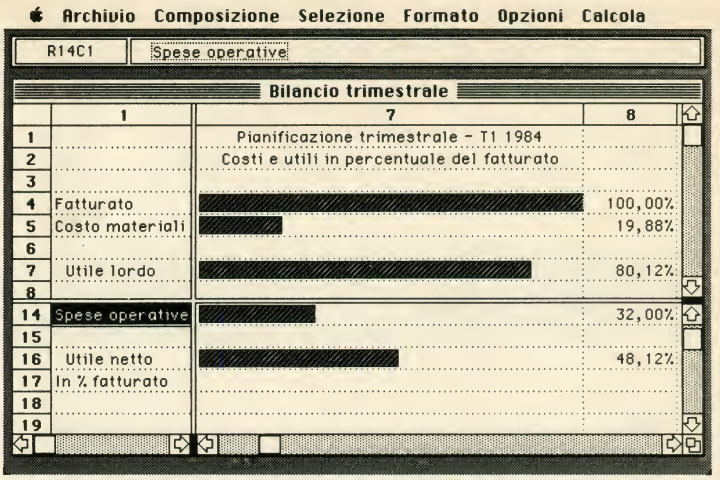
For additional information, contact Ken Abbott at Manhattan Graphics, 163 Varick Street, New York, NY 10013; (212) 924-2778.

ImageSetter

Jay Gee Programming Company

John Golini became interested in typesetting Macintosh graphics when a friend's company took on the task of translating into Italian both Apple documentation and Microsoft programs for the Macintosh.

Golini has developed an interface for the Macintosh that allows it to be connected directly to a variety of typesetting systems (currently



A sample "typeset" graphic from Jay Gee Programming Company.

the Mergenthaler 2200 and 202N, the Compugraphic 8400, and the Autologic APS-5). A *MacPaint* file is sent from the Macintosh to an Olivetti M20, which creates a series of instructions to produce the same image on the typesetter. These instructions are fed directly into the typesetter, by-passing the conventional front end.

The result of this direct connection is the ability to typeset Macintosh graphics very rapidly; each *MacPaint* page takes approximately one minute to typeset. The charge is based on the size of the image being set; the cost to set a full *MacPaint* page is $24.40, with no charge for each disk handled. Golini is currently working on translation programs for *MacWrite* and the Mac version of Microsoft's *Word*.

For more information, contact John Golini at Jay Gee Programming Company, 7185 Blue Hill Drive, San Jose, CA 95129; (408) 257-7795.

68000 Questions

By Andy Hertzfeld

Q: Apple has said that a 512K version of Macintosh will be available by the end of the year. Will the software written for my present (128K) configuration be compatible with the 512K machine? Will the present software take advantage of the expanded RAM, or will I have to purchase upgraded versions of my presently owned programs?—Jeffrey L. Albright, Trenton, NJ

A: Any program that runs on a 128K Macintosh will also run on the 512K version, so you won't have to buy new versions of your presently owned programs. However, not all programs are designed to take advantage of the extra memory space; the amount of memory used depends on each individual application. For example, *MacWrite* does take advantage of the extra memory space (to support much larger documents), but *MacPaint* does not. Generally, all programs will tend to swap less on the 512K machines, since their resources will not be purged as often. You can tell if an application will take advantage of extra memory space before purchasing it by trying it out on a Lisa 2 under MacWorks.

Q: Is there any way of transferring pictures from one Scrapbook to another without just replacing the whole Scrapbook?—Richard F. Randolph, Sandy, UT

A: It's not too hard to transfer pictures one at a time from one Scrapbook to another if you're careful about what you're doing. The secret is to understand when the system focuses its attention on a particular disk.

The system gets its fonts, desk accessories, Scrapbook file, and many other things from the default drive. The default drive is the drive you booted on or the last drive you ran an application from. So to transfer a picture from one Scrapbook to another, you simply do the following:

1. Boot up with the disk you want to get the picture from.
2. Open the Scrapbook, copy the picture, close the Scrapbook.
3. Eject the disk and insert the disk you want to copy to.
4. Run an application on the newly inserted disk.
5. Open the Scrapbook and paste in the new picture.

Step 4 is the one many people miss. Even though the Finder is sometimes a little clumsy about asking for the old disk back at surprising times, it's not so bad once you understand that you must run an application to make the system "switch horses."

Q: Will the double-sided Sony disk drive be compatible with my current single-sided disks? Will I be able to use a single-sided drive internally with a double-sided external drive?—Jon Christie, Los Angeles, CA

A: The double-sided Sony drive will be fully compatible with your current single-sided disks. Double-sided drives will not only have twice the capacity of the current drives but will also perform noticeably faster, since the blocks are organized in "cylinders"; consequently, the drive will have to seek half as much to read a typical file. You will be able to use a single-sided internal drive with a double-sided external drive; the ROM disk driver supports both. The bad news is that double-sided drives will probably not be available for quite some time, so it's a good idea to buy a single-sided external drive now, if you think you need one.

Q: If a hard disk system is attached to the bus, is there code already in the ROM to check for the hard disk and boot from it?—Dave Alverson, North Hollywood, CA

A: There is no code in the ROM to boot off the serial ports, although there is code to boot off either the internal or external Sony drive. Thus, a clever hard disk manufacturer could interface his hard disk through the external disk port and emulate a Sony enough to allow the ROM to boot from it. Also, it's possible to prepare a Sony disk with special, custom boot blocks that cut over to the hard disk as soon as possible so that 95 percent of the booting process will be able to take place on the hard disk.

Q: Does the Macintosh ROM have special (non-68000) op-codes in it? How do these special instructions work? Are they all of uniform length? Can I define my own special instructions?—James R. Pannozzi, Providence, RI

A: Both the ROM and most Macintosh applications have what could be considered special, non-68000 op-codes in them. All of the sixteen-bit instructions that begin with "A" as their first hexadecimal digit are interpreted as Macintosh system traps, invoking one of the almost five hundred routines in the ROM.

You can define your own instructions using the SetTrapAddress call to define one of the twenty or so traps that the current system has left undefined or to redefine an existing one. It's not a good idea to do that sort of thing in commercial programs, though, since it might not be compatible with future generations of the system. Another possibility for defining your own instructions is to use the TRAP opcode (which the ROM doesn't use) to define up to sixteen custom instructions.

Q: Is it the Macintosh ROM or the MacWorks boot disk or both that are required to provide Lisa 2 with Mac emulation capability? Will all of my Macintosh programs run under MacWorks?

A: The MacWorks boot disk is the only thing necessary to provide Lisa 2 with Mac emulation capability. It contains a special version of the software included in the Macintosh ROM, modified to run on the Lisa hardware, and is loaded into Lisa's RAM by the MacWorks disk.

Most Macintosh programs will run on Lisa under MacWorks, but not all of them will. Any program using Mac's four-voice sound or speech capability will not run, and graphics will sometimes look squished due to the difference in aspect ratios between the two machines.

Q: I want to create a disk dedicated to just *MacWrite* or *MacPaint*. What should I copy onto those disks from the system or program disks to optimize my storage

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San Diego, CA 92115

capacity? Do I need to copy the entire System Disk or just the System folder?

A: The System folder contains everything you need for a bootable disk. In fact, you don't even need everything in the System folder. The 1.0 release of *MacPaint* does not use the Imagewriter file to print, so that can be left off of your *Paint*-only disk. You can also leave off the Scrapbook and Note Pad files if you don't think you'll be using the Scrapbook or Note Pad. If you really need to save space, you can even leave the Finder off of the disk as long as you name some other application "Finder." Then your disk will boot directly into the desired application, but you never will be able to quit from it.

People concerned about optimizing their storage capacity should remember to use FontMover to remove the fonts they will never use.

Q: Will Macs ever be able to print sideways the way Lisas can?

A: Yes, Macs are capable of printing sideways (usually called "landscape" printing as opposed to the more normal "portrait" mode) right now, although *MacPaint* and *MacWrite* do not currently take advantage of this feature. Microsoft's *Multiplan* does take advantage of this feature, offering both tall and wide printing orientations.

Q: I would like to customize my Finder by having the dates and times displayed in the more rational formats used by Europeans and the military (i.e., 29 Apr 84, not 4/29/84). Ditto for the headers in *MacWrite*. Also, how about replacing the calculator with one that uses reverse Polish notation? And can the Puzzle be deleted? I'd rather have more space on the disk.—David R. Dunham, San Antonio, TX

A: The Macintosh system includes routines for formatting dates and times internationally, driven by a parameter table kept in the system resource file (or in application or document resource files, if desired), which are used by both *MacWrite* and the Finder. Apple will eventually supply a configuration program to allow users to easily configure the "international" options; for now you can do it if you're a software developer and have access to the resource compiler, the resource-moving utility, and the *Inside Macintosh* book. The format of the INTL resources is described in the section on "Packages," since the international routines reside in package six.

The original calculator that was implemented in November 1982 was an RPN calculator, but we changed it about one year later because we felt most users would find an algebraic calculator easier to understand. I'm sure people will eventually write and market all different kinds of calculator desk accessories.

Right now there is no easy way to remove desk accessories, but the puzzle is only 900 bytes long, so you don't save very much space by removing it. The real space glutton is the Control Panel, which takes up about 8K worth of disk space.

Q: The May 1984 issue of *Creative Computing* presents a comparison of computation speed for several types of computers, including Macintosh. The benchmark program is a short test of speed and accuracy. In this test, Mac is slower in computation time than several eight-bit and sixteen-bit machines. I would appreciate your comments on the test and on the scores obtained by the Macintosh.—Ron Wysk, Suffield, CT

A: The *Creative Computing* benchmark is a Basic program that spends all of its time squaring and square-rooting numbers. You are not really benchmarking the Macintosh at all but the quality and design tradeoffs involved in the implementation of the square-root routine. Since the benchmark does not mention which version of Basic is used (and Microsoft's Basic does not use Apple's math routines), I don't know if this will improve when Apple's Basic becomes available.

It is very difficult to devise a fair benchmark between different machines, since a benchmark is easily biased one way or another. The only real benchmark that matters is how fast a machine is at solving the problems that you need solved.

Q: How can a picture created with *MacPaint* be displayed on the screen by an application program? What is the format of a *MacPaint* document?

A: There are a variety of ways to use *MacPaint* to create a picture to be displayed by your application program. One thing you can do is copy a picture from *MacPaint* into the Scrapbook. Program your application to open the Scrapbook resource file and then use GetPicture to load the picture into memory and DrawPicture to plot it. This assumes you are using a language that has full access to Toolbox routines.

The *MacPaint* file format is fairly straightforward. It consists of a 512-byte header block containing version information, followed by 720 scanlines of 576 dots each, compressed using the PackBits QuickDraw call. To plot a *MacPaint* document, you open the file, skip the header block, and then call UnPackBits (another QuickDraw call) once for each scanline to convert it into a form ready for plotting. You will generally want to unpack into an offscreen buffer so you can transfer the image onto the screen all at once with a single Copybits call.

A write-up on the *MacPaint* document format is available from Apple Technical Support.

Q: What are the differences between *MacDraw* and *LisaDraw* when used on a Lisa that is capable of using both?—James C. Hill, OLA Det 12, West Germany

A: *MacDraw* is very similar to the latest version of *LisaDraw* (version 3.0). Besides the obvious environment differences (*MacDraw* supports desk accessories, while *LisaDraw* is integrated with the Lisa Office System), the most significant difference between the two is that *LisaDraw* supports an Undo command. Mark Cutter, the author of *MacDraw*, chose to drop that feature to help *MacDraw* operate on a 128K machine.

Q: What exactly is the Key Caps desk accessory? Is it used to show the characters in the current font I am using?

A: The Key Caps desk accessory is used to show the current keyboard mapping—that is, which keys correspond to which characters. It is especially useful for showing the characters accessed by the Option key, which are not displayed on the keyboard itself. It always displays the characters in the Chicago font and is unaffected by the current font you are using. Key Caps can also be used to "type in" characters if your keyboard is broken or inaccessible.

It sounds like you want to be able to display all the characters in a given font. The FontEditor program (which is available to software developers) will do this for you, or you can write a very simple MS-Basic program to display all the characters in a font:

```
10 C = 32
15 L = 0
20 PRINT CHR$(c);
25 C = C + 1
30 L = L + 1
35 IF C > 255 THEN END
40 IF L < 50 THEN 20
45 PRINT
50 GOTO 15
```

This will print out all the characters in the current font.

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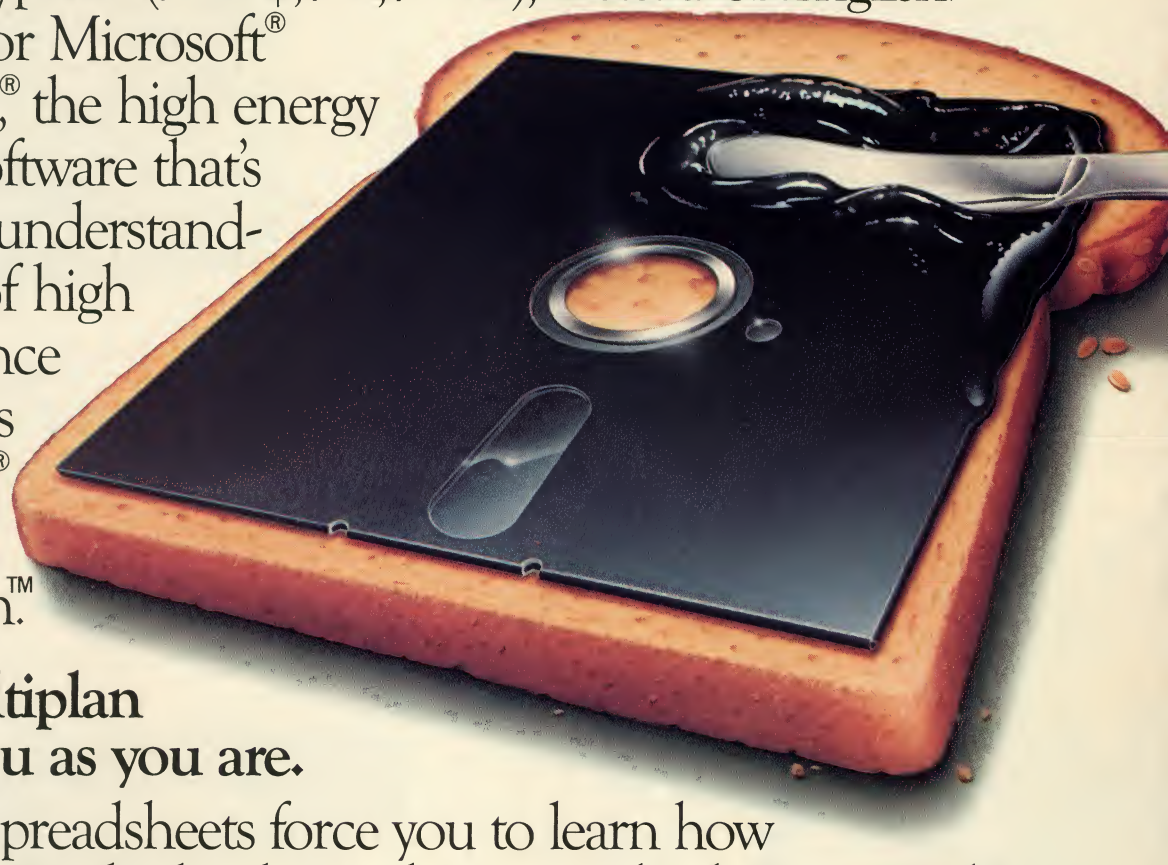

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CONTINENTAL OP

by David Hunter

Marketing Mac across the Atlantic

Photos by David Hunter

Jean-Louis Gassée,
directeur général of Apple (Seedrin) SARL.

Mike Spindler,
Apple's vice president and general manager for Europe.

How does an American computer company like Apple selling a high-tech item like Macintosh make an impact in hard-to-crack foreign markets? How does a funky but elegant adult work camp–Fortune 500 firm take its dream and transport it to other cultures? At what point does an American anomaly become a foreign commodity? Where do you start?

Europe. Last year, 25 percent of Apple's sales went to foreign markets. Europe alone accounted for roughly 15 percent of sales, and France accounted for the lion's share of that 15 percent. The Apple II Plus and IIe have emerged as solid winners in France and other European countries. Now Macintosh and the IIc are making the scene.

Apple is entrenched in European soil, with sales and distribution centers in most European countries and about fifteen hundred dealers Continentwide. Strategic marketing and sales planning occur at Apple Computer International in Neuilly-sur-Seine, just outside Paris. The company has a large distribution center in the Netherlands—Zeist, Holland, to be exact. And a factory in Cork, Ireland, churns out Apple IIes, IIcs, IIIs, and Lisas.

Mike Spindler, Apple's vice president and general manager for Europe, supervises European operations from Apple Computer International's offices in Neuilly on rue de Chartres—not far from the Arc de Triomphe. Spindler is a likable, energetic, excitable, persuasive, and forceful marketer of Apple computers. Fluent in English and French as well as his native German, Spindler has the determined big-mindedness needed for such a large-scale job.

Bob Kissach,
marketing manager of the European Apple 32 division.

"We're marketing personal computers to individuals on a wanted rather than a needed basis," he explains."If you ask, 'Does an individual need a computer?' the honest answer will probably be no, because he's made do for fifteen years without one."

Chez Paris

Another Apple Computer International executive who is keen on Macintosh is European marketing manager of the Apple 32 division, Bob Kissach. Originally from Leeds in Yorkshire County, England, Kissach is familiar with American computer products because he was employed at Data General before joining Apple.

Kissach has been working for more than a year and a half with Apple in Cupertino—particularly with international product managers Joanna Hoffman and Alain Rossmann—on the European launch of Macintosh, to ensure that the machine meets European requirements. The Cork factory started shipping European Macs the last week in May, and Europe's real introduction to the machine occurred in June. Each country worked on a different time table; each was blitzed with national press advertising and television and cinema ads.

Macintosh, as an international product, had a long gestation period. Apple has learned that "you can't sell nonlocalized products in Europe," explains Kissach.

The Localizable Apple

Localizing a product entails going over the external design and internal workings of the machine—such as the keyboard, case, packaging, video interface, internal hardware, systems software, and documentation. Advertising and marketing must also be localized and made to appeal to a wide variety of peoples and cultures.

Unlike in the U.S., television advertising is not Apple's main attention-getting thrust in Europe. The reason is simple. England has only four television stations; France has three. Though the European television industry is gradually expanding, it does not command the attention of half as many people as the tube does in America. On the other hand, Europeans go to the movies a lot. Cinemas all over Europe regularly run advertisements before the main feature. In May and June, Apple ran commercials for Macintosh. One, called the "Morse" ad, included the catchy phrase, "Macintosh is to computers what the telephone is to the telegraph." Another ad played up Mac as a tool for education.

The localization of third-party software is important too. "What we're really trying to do with Macintosh is re-create the II phenome-

Above: Marylène Delbourg-Delphis of A.C.I., a Paris-based cultural software house. Above right: a MacPaint *cartoon by French artist Gerbaud.*

"When people call computers 'the language of modern times,' they're saying something profound. But they don't exploit this concept. They don't see that you can build acute and interesting things with computers. Behind every slogan is a truth to be developed, but you probably have to be an intellectual to do it."

The speaker, thirty-one-year-old Marylène Delbourg-Delphis, is a French woman, a former teacher of philosophy, a writer, and one of the three cofounders of A.C.I. (Analyses Conseils Informations)—a software house specializing in software that concerns culture.

"We believe that microcomputers should be as easy to handle as a pen or a TV set," says Delbourg-Delphis. "A.C.I.'s concept is to build very efficient things that people can

non," says Kissach. "Lisa is a great machine, but when it first came out it was rather closed. With Macintosh we've done completely the opposite. It's a totally open machine like the II."

The key to localizing hardware, says Kissach, is "to build nothing inside the machine that is country-specific."

In the case of Macintosh, both the power supply and the analog board are different in Europe. The Macintosh's digital board is identical throughout the world. Since the ports on Mac's back are identified by simple icons, the plastic case can be used all over the world with no need for localization.

The keyboard is a different story. Since Apple still believes in printing alphanumeric symbols on the keys, the company must tailor some keyboards for different languages. Also—in Europe, at least—the layout of the keyboard must follow the International Standards Organization's layout. The Return key, for instance, is shaped differently and is called the Enter key, though it is used for the same function as a Return key. Apple also does not label any of the keys in English, using symbols for keys like Caps Lock, Shift, and so on.

Kissach says that localizing software—whether to meet the requirements of a different language or a different computing environment—is usually difficult. The old method of localizing software was to dig through a program's source code and translate it line by line.

With Macintosh, it's easy. Mac's ROM software, written in assembly language, contains no English; there are no alphabets or character sets of any language in Mac's ROM. Mac's software consists of a lot of routines that are the backbone of the system and need not be disturbed. The nifty feature that makes software like *MacWrite* and *MacPaint* easily translatable is called a resource file.

Each of Mac's programs from Apple has a module that allows users to change labels, messages, memos, dates, times, sorting sequences, and character sets. The basic graphic approach to the programs remains the same, and it is only the pull-down menus, dialog boxes, and other textual features of a program that are affected.

Die Neue Computerzeit Beginnt

The tricks of localizing a product and promoting it with a certain native flair will get the attention of many people, but that is only the first part of the battle. Apple still has to sell the idea of computing to Europeans who have seen plenty of American consumer fads come and go.

"Our philosophy is not 'man approaches the machine,' but the opposite. Macintosh approaches man," says Spindler. Apple may indeed have hit upon a way to make personal computing a worldwide phenomenon—the use of graphics-oriented software with a practical, commonsense bent. Still, in Europe as in America, many people are intimidated by personal computers.

HAUTE-TECH

use without any retraining. We believe in reacting to people's intelligence, not just capitalizing on their naiveté."

A.C.I. is headquartered in a beautiful nineteenth-century building on avenue Hoche in the heart of Paris and has another office in New York City. The company was founded two years ago by Delbourg-Delphis, Christian Marchandise, and Thierry Lefebure.

A.C.I. is currently active in five different areas—videotex, consulting, computer-generated art, software publishing, and international computer-aided trading.

It all started when Delbourg-Delphis became involved with a project to create a display of the history of French perfume for the Musée des Arts Decoratifs (the Art Deco Museum), which is a part of the Louvre. As she waded through old periodicals, compiling advertising materials on six thousand brands of perfume, Delbourg-Delphis hit upon the idea of using a computer to create a "visual database."

The idea was to create software that could use several slide projectors. The projectors would be hooked up to a computer in such a way that a visitor to the museum could see any one of fifty thousand visuals simply by hitting a few keys. The eventual result was a system that permitted a person to control sixty slide projectors from one Apple III.

For another project at the same museum, Delbourg-Delphis and her partners decided to use the Lisa. The mouse/pointer made it even easier for patrons of the museum to order up visuals from the slide projectors.

Delbourg-Delphis says this was the first time a Lisa was shown to the public in Paris. "It was an event." Soon the whole Art Deco museum will be equipped with Lisa 2s, and it's possible that other museums in France will follow suit.

A.C.I.'s software for manipulating the visual database will be available for the Macintosh in September.

Another aspect of this uncommon company is what Delbourg-Delphis calls the A.C.I. Studio. At an exhibition of experimental art last year, Delbourg-Delphis opened more than a few eyes when she brought a Lisa to the show. "We had French comics illustrators show how real quality drawings could be done on the Lisa."

When Delbourg-Delphis first got involved with the museum work, she had never seen a computer before. About that time she met Jean-Louis Gassée, founder of Apple (Seedrin) SARL—Apple's French distributor.

"I have tremendous admiration for Jean-Louis," she says. "You know France was rather prejudiced against American things, and Apple sounds real American. What Gassée has done in France is totally amazing. He's made Apples appealing to the intellectual minds that are found everywhere in France."

Through her association with Gassée, Delbourg-Delphis was able to see and experiment with the Macintosh before its announcement. For Mac's launching in Paris, she talked several well-known comics artists into creating comic strips with *MacPaint*. The result was a wild and wonderful collection of abstract, realistic, and humorous works of Mac art.

"Macintosh is like a box of painting; it's become as familiar as that." Nowadays, the A.C.I. Studio is a high-tech playground for accomplished artists and students of computer graphics. Both Lisas and Macs are employed in the studio.

For Delbourg-Delphis, microcomputers are much more than fancy business and personal productivity tools. They are a way of life, a guiding force.

"Instead of conceiving of software as pure technique, we believe software is a kind of grammar for thinking, a grammar to organize one's world." Delbourg-Delphis goes on to cite the fact that Leibniz Pascal, the influential logician whose theories are embodied in most computers, was first a grammarian. "The birth of modern logic came from an analysis of grammar," she says.

With software as the new grammar, we now have a "new rhetoric of business and culture, thanks to microcomputers."

Jean-Louis Gassée is the directeur général of Apple's distribution center in France, Apple (Seedrin) SARL; a native Frenchman; and one of the forces behind Apple's gallant charge into the French market—a market that saw a 100 percent growth rate in 1983.

"Our job is to make innovation banal," says Gassée. "The Apple II has become a commodity. Now we must make Macintosh a banal product."

According to Gassée, Apple could do as much as $100 million in French sales this year. Macintosh, Lisa 2, and IIc sales are expected to account for most of that figure.

A Nous la Liberté

Before 1980, Apple did not have much going in Europe. In the late seventies, a Frenchman, André Sousan, set up independent arrangements with European import companies to buy Apples "at arm's length," says Spindler. The early dealers were more or less on their own, with no localized hardware and software. In those days, many dealers wrote their own software along a small-business theme. What few distributors there were did the best they could.

Today, Apple has the "premiere physical distribution mechanism in Europe," says Gassée. The founder of Apple (Seedrin) SARL, Gassée sold the French distribution company to Apple last year. With a typically active French intellect and love of culture, the crusading Gassée has created a loyal, energetic group of dealers in France.

It's been almost four years since Apple began building the marketing infrastructure of dealers and distributors needed to sell computers throughout Europe. Last year saw fantastic growth in France, near-fantastic growth in Italy, and so-so growth in the northern European countries. Now, with Macintosh and the IIc, Apple is poised to make a killing or, to put it more politely, a big impact on the market. Everyone agrees that the Macintosh's technology is extraordinary.

Une Nouvelle Génération

When Lisas first appeared in European stores, about nine months after the computer was unveiled simultaneously in the United States and Europe, the machine attracted many lookers but few buyers. One reason was its price tag—around $12,000. Another reason was the people Apple was trying to sell Lisa to.

"We're great analysts after the fact," says Gassée. "That Apple would have trouble selling a $10,000 product? This hadn't occurred to anyone. We positioned it too much at the corporate market, where we're not always welcome."

Gassée says Lisa has been selling quite well, but not up to expectations. "If we sell twice as many IIes as we think we will, nobody says, 'Aha, they sold twice as many Apples as they thought.' But if we sell half as many Lisas, they say, 'Aha, we told you so.' That's the name of the game. The French say, 'The higher the monkey climbs, the better his back side is seen.'"

Though the European corporate masses stayed away from Lisa, the machine created a lot of interest. The design of the machine appealed to businesspeople and the technologically curious. Then Macintosh was announced in January of this year, attended by much publicity and praise in the European press.

Perhaps the most attractive external feature that Lisa and Macintosh offer to European businessmen is the mouse/pointer. European men are not fond of touch-typing. They feel that typing is work fit only for secretaries. Beyond this chauvinism lies the same fascination with mouse-and-icon operation that makes Mac and Lisa popular with both sexes in the United States.

The main problem with selling computers to big business in France is that business and industry there tend to be more centralized, particularly with France's current Socialist government under the leadership of Francois Mitterand.

Gassée himself has a disparaging view of big business. He sees most companies as employing tyrannical managers that make workers suffer with bargain-bought equipment. If a company is buying cars for its employees, it will go with the best deal it can find—foreign or domestic. "Our future is not in selling to big business," says Gassée. "The personal computer is not institutional."

Gassée and Apple haven't given up on all corporate customers, however. The Lisa 2 and Lisa 2/10 are less expensive, and the software

is now unbundled. Mac's good press has generated new interest in Lisa, and dealers are starting to carry both machines. Gassée says these developments have helped to shift Lisa away from "the exclusive elitist position" it had at the beginning of its European life.

Now that Macintosh has made it to Europe, Gassée says it'll be interesting to see how Mac and Lisa sell together. "I have no expectations for Macintosh sales," he says. "Lisa was a good experience. We didn't perish. It was a healthy dose of modesty injected into our good-sized egos."

East of Cupertino

The Macintosh's low price, Gassée believes, will be attractive to conservative European consumers. The message is getting out that "personal computers are a small investment, that the cost of a personal computer won't kill you."

In England, small computers like those built by local whiz kid Clive Sinclair sell very well. U.S. households on the average spend up to $1,000, while in Europe the cutoff level is usually half that. "In the United Kingdom the awareness is there," says Kissach, "but the price point is still a problem. People don't say, 'I need this.' We haven't gotten people's real acceptance yet.

"France has recently just exploded. There is acceptance of the personal computer as a power tool of the mind," Kissach explains. "In France there's a want. Germany is the least well-developed of the large European markets. We haven't reached the nerve, but we're getting there."

Gassée believes in appealing to consumer feelings instead of merely to the intellect. "The personal computer is for normal people, not just the technopriests. We tell them the personal computer is power. It frees you, liberates you. It's a catalyst for the intellect.

"Apple has a Dionysian view of computing, not totally organized, not institutionalized," says Gassée. "You don't have to have great plans to use a personal computer. It can be approached in an uncertain, unstructured way."

The personal computer, particularly one like Macintosh, brings life to the idea that "work is not always labor," says Gassée. In the past, accounting was usually accomplished with pen and lots of paper. Now these tasks can be done on a computer faster.

Gassée illustrates the power of a personal computer like so: "If you walk into a field of tall weeds, you don't see much detail. But if you looked down from an airplane, you might see an ancient Roman villa. You can see more from a height than with your feet on the ground. Buried in facts, you don't see anything.

"The personal computer enables you to lift yourself above the data. The human mind is incapable of processing large amounts of data at one time. But the human mind is good at illogical logics. The computer churns the masses of data and allows you to split the load."

The key to opening the door to Gassée's philosophy of "unstructured sophistication" is good software. This is why Apple courts European software developers with the same levelheadedness that it displays in its dealings with stateside developers. Apple's goal, says Kissach, is to provide a trading environment wherein "good-quality U.S. software" is available to European consumers without the usual time lags and localization problems. Apple also wants to help European developers sell their wares in other European countries, as well as in the United States, in order to create a more evenly balanced flow of software.

Most Mac software projects in Europe to date have centered on the productivity theme—databases, management-type games, and small business applications. Europeans have not gone glassy-eyed over computer games as American consumers have. Either way, business or entertainment, Macintosh software is so easily translated that a good program with even limited appeal could become an international hit.

It's a Mac World

Will there be an Apple University Consortium in Europe? According to Spindler, Apple is looking at different ways of implementing such a program. Though successful with a variety of primary education programs, Apple may have a tough time convincing higher education institutions to commit millions to buy hardware and to share their software.

"We view this business as changing very rapidly," explains Gassée. "What works today may not work a year from now. When we know Macintosh's total sales in 1984, we will know if it's a great product. The marketplace will decide, not us. The early indications are good. But I'm always superstitious."

Gassée is more than a little worried about "Japan Inc." In the past, the Japanese have excelled at manufacturing and have captured world markets in televisions, stereos, cameras, and watches. "Actually, Macintosh is a great testimony to Japan Inc.," Gassée asserts. "Quantity. Quality. Cost. We manufacture Macintosh like a Japanese car. But we excel at the aspect we have an advantage in—software technology.

"We must keep Japan Inc. at bay in manufacturing technology as we develop our advantage in software technology. If we fail to do either, we will disappear."

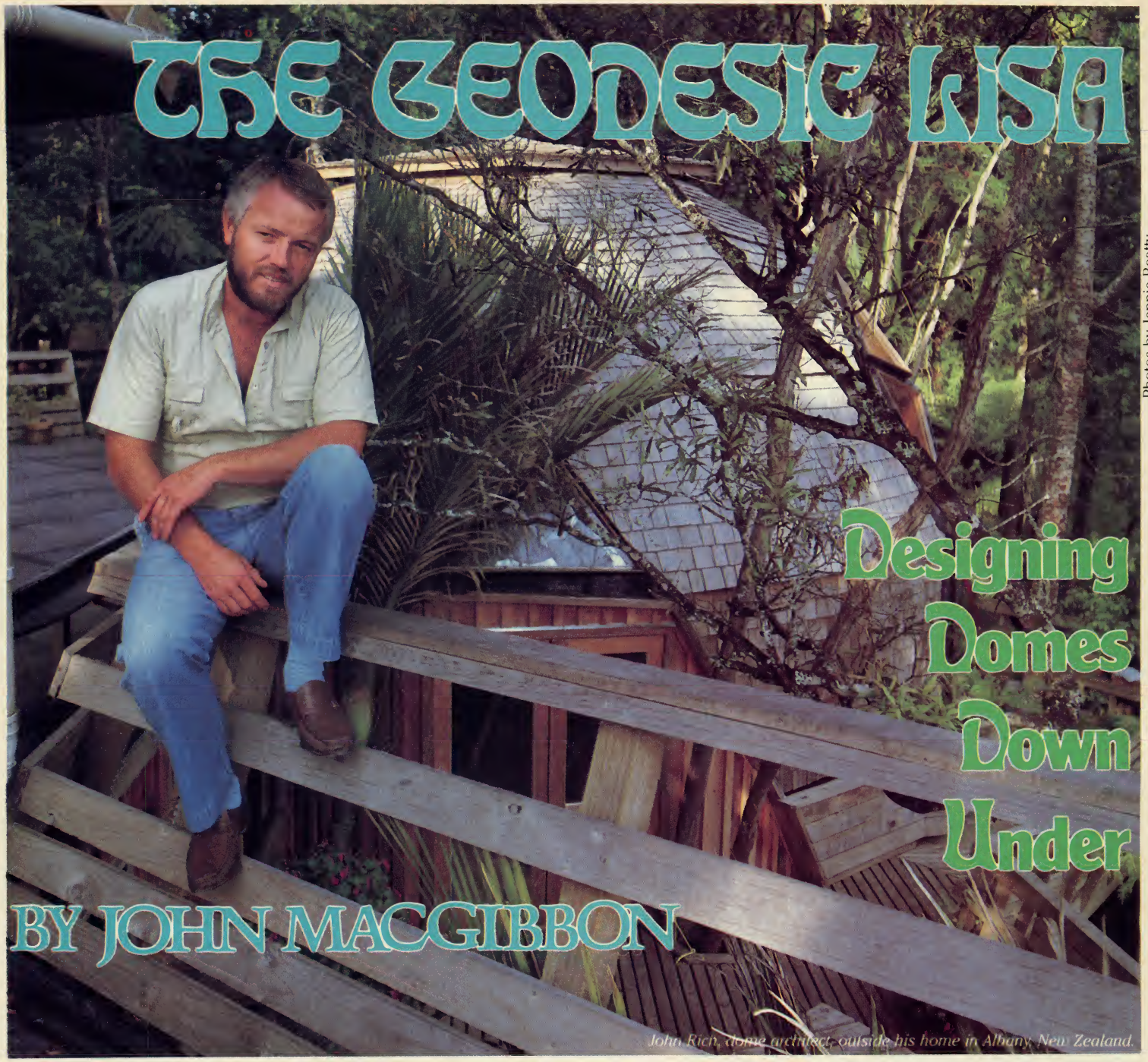
Spindler seems confident that Apple is on the right track. He flies to Cupertino once a month to meet with Apple's president, John Sculley, keeps a close eye on the American scene, and lets his managers in each country do their own thing once a product is introduced.

Apple's marketing strategies, neatly divided into the thirty-two-bit and eight-bit groups, are "mainstream," says Spindler. "You haven't seen the last version of either strategy. Apple's philosophy is to bring out a few, but remarkable, products."

THE GEODESIC LISA

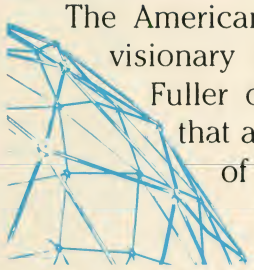
Designing Domes Down Under

BY JOHN MACGIBBON



Photos by Jennie Beatty

John Rich, dome architect, outside his home in Albany, New Zealand.



The American architect and visionary R. Buckminster Fuller once postulated that a geodesic dome of huge diameter would act like a balloon.

In the early 1970s John Rich, a young man in Auckland, New Zealand, decided to check the theory out. He reckoned that with today's technology it would be possible to build a metal sphere two kilometers in diameter. One hundred levels could be built inside the sphere, providing enough space for one hundred thousand people. Each person would have fifty square meters of personal space, yet there would still be room for golf courses, equestrian parks, and artificial lakes.

Rich estimated the total weight of the sphere, then calculated the total weight of air that would be displaced by a one degree centigrade rise in air temperature. He discovered that, yes, the whole sphere would float away like a balloon.

At the time Rich was an engineer who had dabbled in geodesic dome design and had built a few models. Today the dabbling has become a career, and he has become New Zealand's foremost designer and builder of geodesic domes.

Rich says his structure is low-tech—but that is true only at the building stage. His design work is definitely high-tech; it's done on an Apple Lisa microcomputer, using *LisaDraw* and *LisaCalc*.

Dome on the Range

This fascination with geodesics began in 1969 when Rich, then a student, was shown a model dome by a friend blessed with the unlikely name of Wendy the Moustache. Rich wasn't particularly impressed.

Later, when New Zealand celebrated sixties counterculture with its own version of the *Whole Earth Catalog*, Rich read how to construct a geodesic dome using plastic drinking straws. He tried, became hooked, and today, more than two hundred models and full-size structures later, he's still churning 'em out.

Rich built his first dome "of any size" nine years ago; it followed a dozen or so domes of greenhouse dimension. His real career watershed came in 1980, when Rich designed and built New Zealand's first large permanent dome. This was an eighty-foot-diameter pack-

ing shed and fruit sales center in the shape of an ellipsoidal icosahedron.

The following year Rich got into domes full-time, and he now provides a comprehensive design and building service.

With his trusty assistant, the Lisa, Rich offers geometry programs and structural analysis of geodesics for domes of any shape, frequency, form, or size. He will use any material, though his preference is for lumber and plywood. This is not surprising, given the abundance of wood in tree-rich New Zealand.

Rich lives on an eleven-acre block near the small village of Albany, twelve miles north of Auckland, New Zealand's largest city.

The steep block, heavily wooded with native bush and tree ferns, is also home for his wife Michelle, children Christopher, Daniel, and Benjamin, and an assortment of animals.

Other than in their choice of dwelling, the Riches are fairly typical settlers. Most of the district has been subdivided into ten-acre farmlets by people who have escaped city life. Auckland may not be large by American standards, but with a population of nearly one million it represents big smoke and fast living in this small South Pacific land.

Unlike most of their neighbors, the Riches are not urban refugees. They came from a kiwi fruit orchard 230 miles away at Opotiki in the Bay of Plenty. Moving to Albany meant reunification for the family, because Rich had previously divided his time between work at the plywood factory in Auckland and commuting home on the weekends.

Inside a Dome Home

Rich's approach to geodesics is practical more than mystical. His own home combines a dome with a more conventional pole home construction. The materials—poles, framing, plywood, and shingles—are pinus radiata, the most common exotic timber species in New Zealand. Originally imported from California, the species is the basis for an important and growing timber industry. Pines grow faster in New Zealand's moist and temperate climate than anywhere else on earth.

The twenty-six-foot-wide dome portion of the house includes the lounge, plus a mezzanine library level. The dome interior is attractively paneled with native kauri timbers. Triangular windows at varying angles lend interesting slants to the outside world of clouds, trees, and ferns.

Furnishings are simple, with an emphasis on natural materials: a lovely old out-of-tune piano, a couple of sideboards, some whatnots containing family heirlooms, a lounge suite, and an old stuffed sofa.

Plus a stereo. Domes make magnificent music.

Leaks, often a problem in geodesic domes, have not occurred. The weatherproofing, consisting of the pine shingles plus butyl rubber, has been effective. Butyl also forms a lining for gutters, which are built from plywood.

Service areas of the house such as kitchen, laundry, and bathrooms are in the "conventional" structure, as are bedrooms and Rich's study. Not being a purist, he will admit that circular domes don't suit all purposes. For instance, house fittings such as baths, showers, benches, and tubs come in rectangular shapes. Nonrectangular fittings in New Zealand have to be custom-built and thus are expensive.

The home's immediate environs are all raised above the ground: wooden decking supported by poles. Plants in terra-cotta pots substitute for flower gardens, while trees just come naturally—the house nestles among an impressive stand of tall, clean-limbed kauris.

Days of Domes Down Under

Rich admits that his domes are less sophisticated than some of the large American structures, which have even borrowed techniques from Boeing and NASA.

"Here in New Zealand, with a small market and a lower level of technological development, we've needed a different approach to geodesics," he says.

"We must look at what technology is available and develop building systems to suit it. We're about halfway between the mud hut and the space shuttle *Columbia*."

While he admires the technology in kitset packages marketed by U.S. companies such as Monterey Domes and Cathedralite Domes, he points out that New Zealand doesn't have the market to justify volume production of such material.

"We just have to cook with what's in the larder," says this antipodean dome builder.

The main point is that his houses work, look good, and are relatively cheap. And in terms of domestic dome housing design, he reckons he could teach Americans a thing or two. Rich believes he is about five or six years ahead in some areas.

Occasionally he does have daydreams beyond budgetary considerations. One such dream is to build a dome as a skybreak over most of a section of land in which hedges and gardens would be used as internal partitions. There would be several levels, some made up of lawns, others composed of brick patios, and still others containing timber decks. A garden would hang from the internal surface of the dome, and the design would include solar heating.

But realistically Rich considers small domes of 575–850 square feet with a mezzanine level over 60 to 75 percent of the interior to be the most economical for an average-size house. Additional space can be provided in simple rectangular projections from the dome.

"Stay as simple as you can—domes don't need to be large in order to feel large," he says.

Building costs end up about the same as for conventional houses, even though a geodesic dome has only 25 percent of the framing timber. The surface area is about 60 to 70 percent that of a conventional house.

But you can get away with cheaper materials in conventional houses, and fittings such as doors and windows can be bought off the shelf. Not so with a dome house.

"To seal a dome adequately you've got to use quality products like asphalt or timber shingles, as well as butynol. You're putting your savings back in quality, so you end up with a better house," Rich explains.

You also get a very strong house, an important consideration in this earthquake-prone country. Geodesic structures are immensely strong in relation to their mass.

"Geodesics are the way the universe is held together," Rich explains. "Like the moon spinning around the earth and the earth spinning around the sun—it's a question of a balance of forces. And these forces tend to be triangulated and hold things stable."

Other advantages enjoyed by domes include lower insulation cost, and lower ongoing energy costs for heating and air conditioning.

Rich has now designed and built twenty-seven sizable domes. They range from a small egg-shaped dome for a Buddhist community to his current project, a 200-seat theater restaurant at Whangarei, in the far north of New Zealand.

A unique aspect of his business is the extent to which he is able to change the geodesic form to suit the requirements of customers. For that ability he has the Lisa to thank.

Dome Design for the Daring

One of the unavoidable high costs in dome architecture is the design work. More thought has to go into dome design than into a conventional house.

Domes may look simple, but their geometry can be extremely complex, particularly if customers want something more than a very straightforward design.

For instance, the "standard" spheroid, three-frequency icosahedron dome is impractical if the diameter exceeds thirty-three feet. It becomes very tall and needs to be squashed down a little. This is harder than it sounds and requires a considerable amount of complicated recalculation.

A spheroid form requires only two different panel sizes and three connector variations. Moving to a three-frequency ellipsoidal dome requires twelve-panel variations and eight connectors. A quantum jump in complexity comes with the four-frequency super-ellipsoidal dome, which requires eighty-five panel variations and fifty-three hub connector variations.

With *LisaCalc*, changes can readily be made if a client changes her mind about the size and shape of the dome. Variables can just be fed into the specification master, and, presto, there's your new dome.

"Now I can take a dome and rotate it to whatever node I want at the top, and then squash it, stretch it, or even turn it into a super-ellipsoidal shape like a television," Rich explains.

"Lisa will then print out the XYZ (Carte-

Lisa helps Rich do calculations he couldn't do on his Apple II.

sian) coordinates.

"I've also used *LisaCalc* to invent my own free-flow, amorphous shapes that follow no regular geometry. To draw them I use the graphics package to print out the coordinates, then swop them across to *LisaDraw*, draw it up, and then turn it around."

Still, his most complex dome was designed on a Casio FX-80 scientific calculator. It was a four-frequency super-ellipsoidal icosahedron recently designed and built for the Plywood Association of New Zealand. Nearly rectangular, it had only just enough curvature to qualify as a dome.

Designing that dome took forty-two hours of calculation. It could be done today with *LisaCalc* in about three minutes.

"The beauty of Lisa is that you don't need any training; with *LisaCalc*, if you have basic algebra as one of your skills, you can do it," Rich explains.

He estimates that the computer saves him one extra wage bill, and he anticipates more savings when Apple releases a drawing package for its color plotter. Structural analysis is another application he's looking forward to using.

Before buying the Lisa, Rich tried an Apple II and *VisiCalc*. He quickly gave it up.

"I was overloading it at one frequency, which was a basic icosahedron. As soon as I tried to break the basic triangle down into smaller triangles the Apple II was completely and utterly hopeless. I looked at boosting the memory, but it still wasn't going to get anywhere near what I wanted."

So it was simply a case of *Move over Apple II, make way for one megabyte of Apple Lisa*. Though Rich has never regretted the move, it was a different matter for his kids, who had enjoyed the Apple as a games machine.

"We tried, unsuccessfully, to set up a system with the Apple II where the kids could play games only if they did something educational first," says Rich. Now, fobbed off with a substitute Sinclair ZX81, the children are less convinced about the Lisa than their dad.

Even Lisa itself cannot always cope with dome geometry. Rich has "hung" the system five times trying to do calculations that are too big.

Beyond design work, the system is paying its way handsomely in business administration. Standard functions like word processing, invoicing, debtors and creditors, stock, wages, and wages analyses are obvious and very welcome benefits.

However, much of Rich's admiration is reserved for a program he never thought he would have much use for: *LisaList*, a simple unstructured database.

"*LisaList* is just amazing," Rich says. "Now we use it to keep all our diary records, all our phone calls—everything gets entered into the database at some point. And we can easily unscramble the list and print out data relating to, say, a particular client, or a particular day."

But no one is ever satisfied. In fact, Rich has a few suggestions for Apple Inc.

For instance, why not include four-function mathematical capability in *LisaList*? Why can't you stack up the "look-up" and "search" functions in *LisaCalc*? Couldn't moving between packages be made easier?

Rich's Lisa didn't come cheap: NZ$26,450 to be exact. And he was furious when, less than two months later, a combination of lower pricing by Apple and a reduction in government sales tax brought the price down to less than NZ$18,000.

Even this figure would have U.S. buyers shuddering! Nevertheless Rich is more than happy with his investment. He'll stick with Lisa, but....

"Lisa will be made redundant by the one I can talk to," he says. "I'll be able to drive along in my car and say to my computer, 'What's the latest situation with the cash flow?' And it'll say, 'You can retire in seven days' time.'

"That will be my choice of computer."

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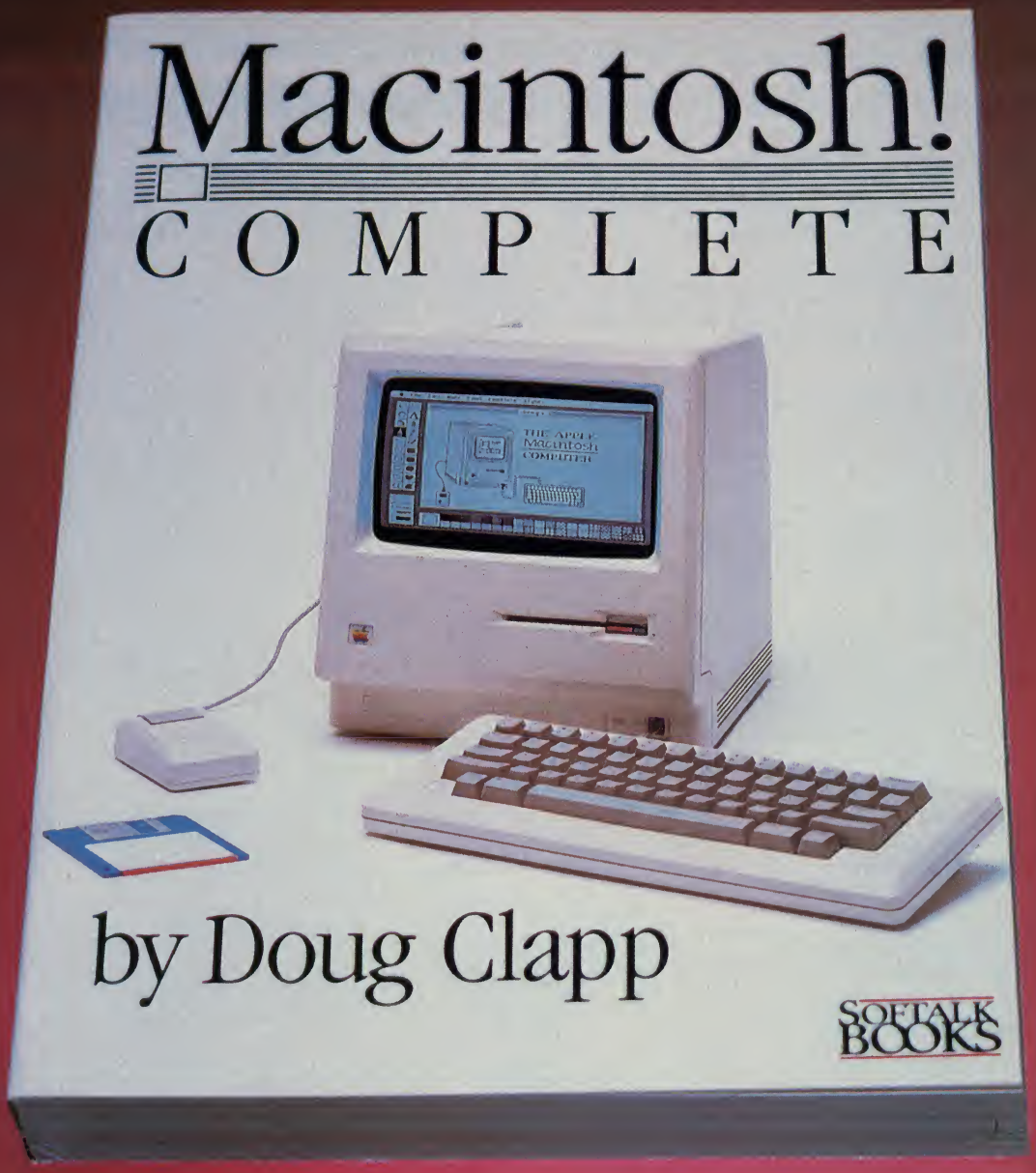

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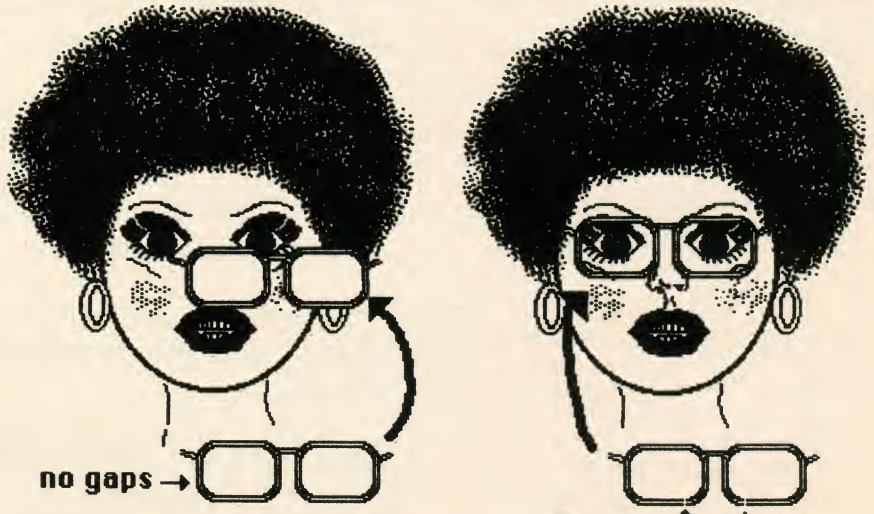
Clicks & Pointers

Edited by David Durkee

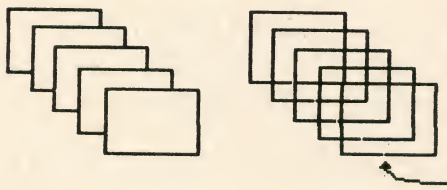
The Well-Placed Leak

The accompanying illustration demonstrates an aspect of the lasso in *MacPaint* that some readers may not recognize at first: the virtue of a hole in the wall.

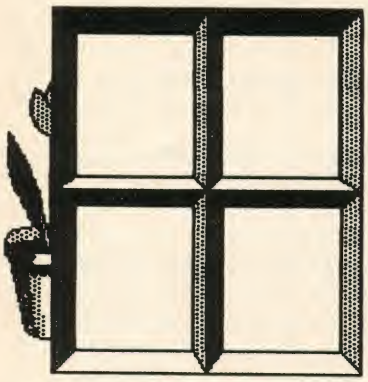
One difference between the lasso and the selection rectangle is that the lasso moves just the object surrounded by the rope, while the rectangle moves everything within it, including the white background. The lasso, while it moves just the object, treats any enclosed spaces as opaque, so they obscure the background over which they're moved. Making a small gap in the outline of an enclosed space causes the white part of the object to become transparent. To make part of the white space opaque and part transparent, tunnel through the opaque part so that the transparent part isn't fully enclosed and the opaque part is, as shown in the Fat Bits picture.—Sue Knopf, La Crosse, WI



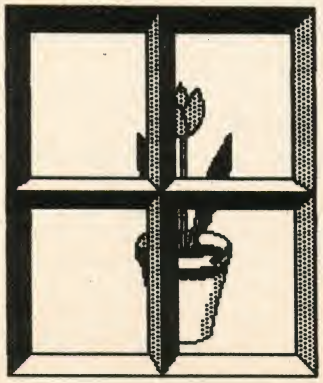
When moving hollow shapes by using the lasso, leave a tiny gap in the outline to make the shape appear "clear." If no gaps are left, the shape will appear opaque. The gaps can be filled in later using Fat Bits.

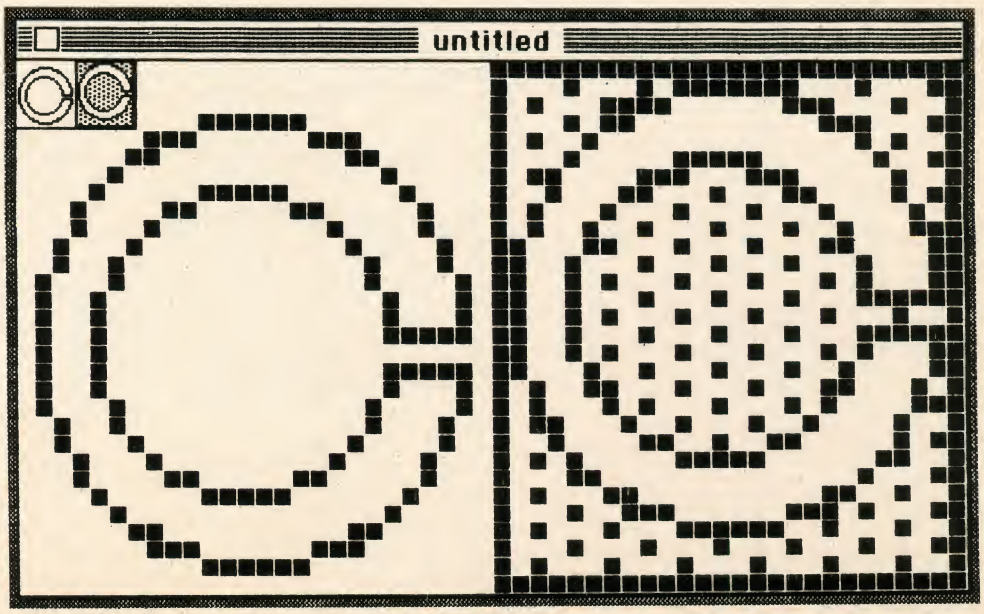


The design on the left used a rectangle with no gap; the one on the right used a rectangle with a gap.



The window on the top had no gaps; the one on the bottom had gaps from the outside into each pane, which were later filled in.





Camarillo

The Real Estate News

Vol. I, No. 1 Camarillo, CA April, 1984

Unusual Home On Market Now

An impressive Rancho Lomita home, set high above the street, is now available.

Featuring five bedrooms and three full baths, this custom home is tastefully decorated, with near-new carpet and drapes throughout.

Clients will appreciate the **cross ventilation** in four of five bedrooms.

SURPRISE FOR YOU UNDER THE EAVES

Open the single garage door and you will see a 50-foot driveway, completely covered by the eaves.

Twelve feet further back is the large 2-car garage with workbench.

California Living On 2-Level Patio

The back yard at this home, located at 138 Camino La Madera, is made for California living. A 2-level redwood patio surrounds the trunk of a large magnolia tree.

Across the back of the yard are bearing avocado, lemon, tangelo and orange trees.

In back of the detached garage is a garden plot, for those who aren't lazing around on the patio.

HAVE WE GOT A MBR FOR YOU !!!

The master bedroom in this home is 12x18, with 2 (count 'em) walk-in closets. A beautiful new shower, too.

WHAT? ANOTHER PATIO JUST FOR BBQ?

For clients who like to BBQ (that's barbecue), there is a gas jet on a small concrete patio just off the kitchen door.

For partying, a gas jet is also located on the back yard patio (near the 2-level redwood patio).

Parties for more than 150 people have been held in this home with room to spare.

More MacWrite Surprises

In the May Clicks & Pointers, we described a method for creating footnotes in *MacWrite*. In the same spirit of taking the machine beyond its arbitrary boundaries, here's a reader-contributed tip about printing out in a two-column format for newsletters, fliers, and pamphlets:

Mac users who wish to create a two-column, justified newsletter can do so easily by following these simple instructions:

If you want a masthead, create it in *MacWrite* or copy one from *MacPaint*. Insert a ruler after the masthead. Set the margins for the left-hand column of printing. The left margin should be on the left side of the page and the right margin should be somewhere in the middle of the page. Now type the text to go in the left column.

Insert a page break and another ruler. Set the margins for the right-hand column. The right margin should be on the right side of the page and the left margin should be just to the right of the old right margin. If you used a masthead, press return several times to create space for it in the right-hand column. Type the text for the right column. This text will appear below and to the right of the left column instead of directly to the right of it.

AT YOUR FINGERTIPS

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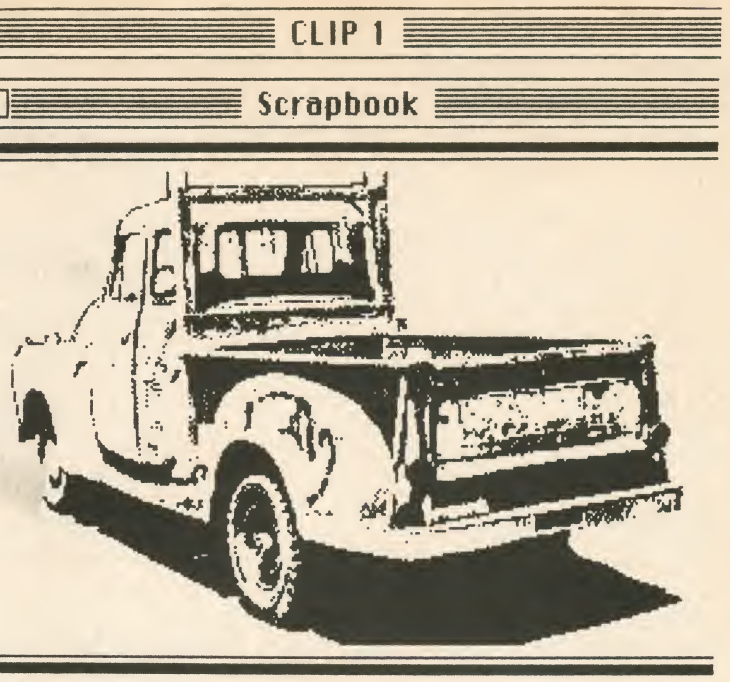

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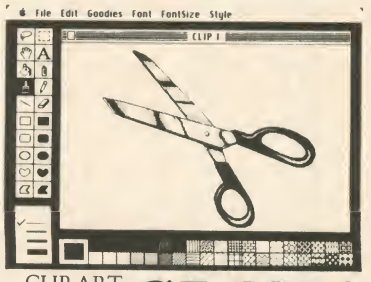

CLIP ART FOR THE MAC **CLIP 1**

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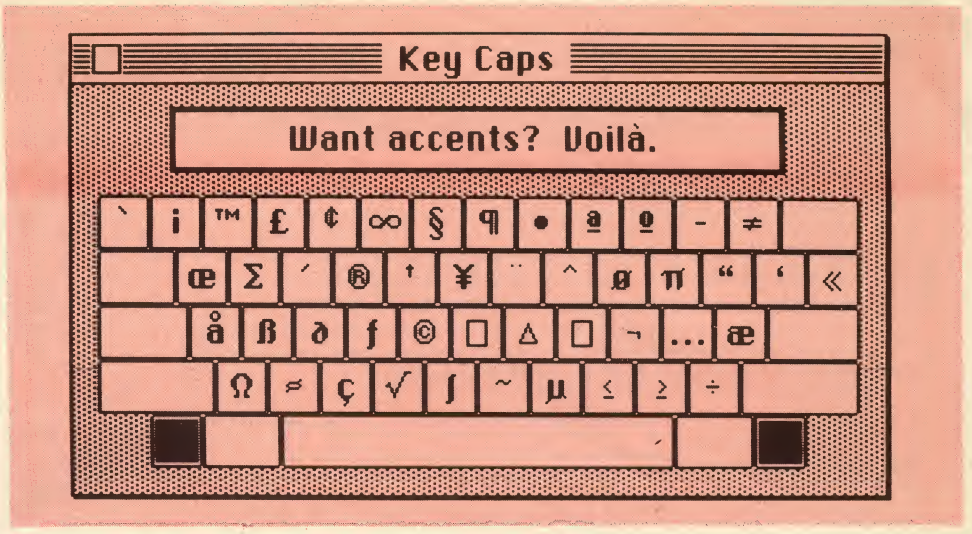
When you're ready to print, select Print from the File menu. Click on the Cut Sheet option, even if you're using fan-fold paper. This will allow you to roll the paper back up to the top of the page after you've printed the first column. The Mac will prompt you to insert paper before you print each page, then click OK. For the first column, just click OK. When the first column is done and the Mac gives you the "insert paper" prompt again, just roll back to the top and click OK. The second "page" will print out on the right-hand side of the first page.—Philip C. Russell, Camarillo, CA



MacWrite Writ Wide

Here are a few tricks to help you get the most out of the new version of *MacWrite*. One complaint about *MacWrite* has been its inability to print a line longer than six inches. You can actually type a seven-inch line using the following technique: First, slide the indent marker and the left margin marker on the ruler as far to the left as they will go. Then drag the whole *MacWrite* window over to the left by pointing to the title bar and dragging. You'll only be able to go so far. Be careful not to wander up or down in the process, because you'll want to be able to see the top and bottom of the window later. Use the size box in the lower right corner of the window to stretch the window as far to the right as possible. Now you'll be able to drag the right margin marker out to the eight-inch mark. Subtracting the minimum one-inch left margin, you get a seven-inch line of print.

Another useful trick is to transfer formatted text from *MacWrite* to *MacPaint*. Since *MacPaint* doesn't do justified text and makes it difficult to mix styles and fonts within the same line of type, you need to use *MacWrite* to do those things, but copying text using the Clipboard doesn't copy any of the formatting commands with the text. There is a way to move images from the screen into *MacPaint*, though, and it works well with *MacWrite*'s formatted text.

Type the text exactly as you want it to look later in *MacPaint*. This includes font, size, and style settings, spacing, justification, and margins. When you have on your screen exactly the image you want to transfer to *MacPaint*, type shift-Command-3. The disk will whir and the Macintosh will create a snapshot file of the screen image. The file will be in the form of a *MacPaint* document called *Screen 0* (unless you've used this trick before, in which case the new file will be called *Screen 1*, or whatever).

Now you can quit *MacWrite* and double-click on the snapshot file icon to edit it in *MacPaint*. You'll have to erase the borders of the window, as the snapshot will be of the entire screen. The limitation of this technique is that you can only capture a screenful of data image at a time, but it still allows you to do things that would be impossible otherwise. —Russ Sprouse, Northridge, CA

MacWrite with a Foreign Accent

New features of the Macintosh keep popping up all over the place. Have you ever wondered if there's any way to put accents over letters on a computer? There probably hasn't been any reasonable way until now, but the Macintosh was designed with the European market in mind. You may have noticed by fiddling with the Key Caps accessory that several accent marks are included in the Option key versions of the Mac's character sets. But how do you get an accent *over* a character? Try this in *MacWrite* (or *MacPaint*):

Type Option-u; that is, hold down the Option key and press the *u* key. Nothing will happen at first. Now type the letter *a*, and voila! An *a* with an umlaut over it! If the second character you type is a vowel, the accent will appear over the vowel. If it is any other character, the accent will be printed by itself followed by the character. This works in most fonts, although not in Cairo or London. Here are the Option keys that give the Macintosh a foreign accent:

Option-` *(letter)* à
Option-e *(letter)* á
Option-u *(letter)* ä
Option-i *(letter)* â
Option-n *(letter)* ã

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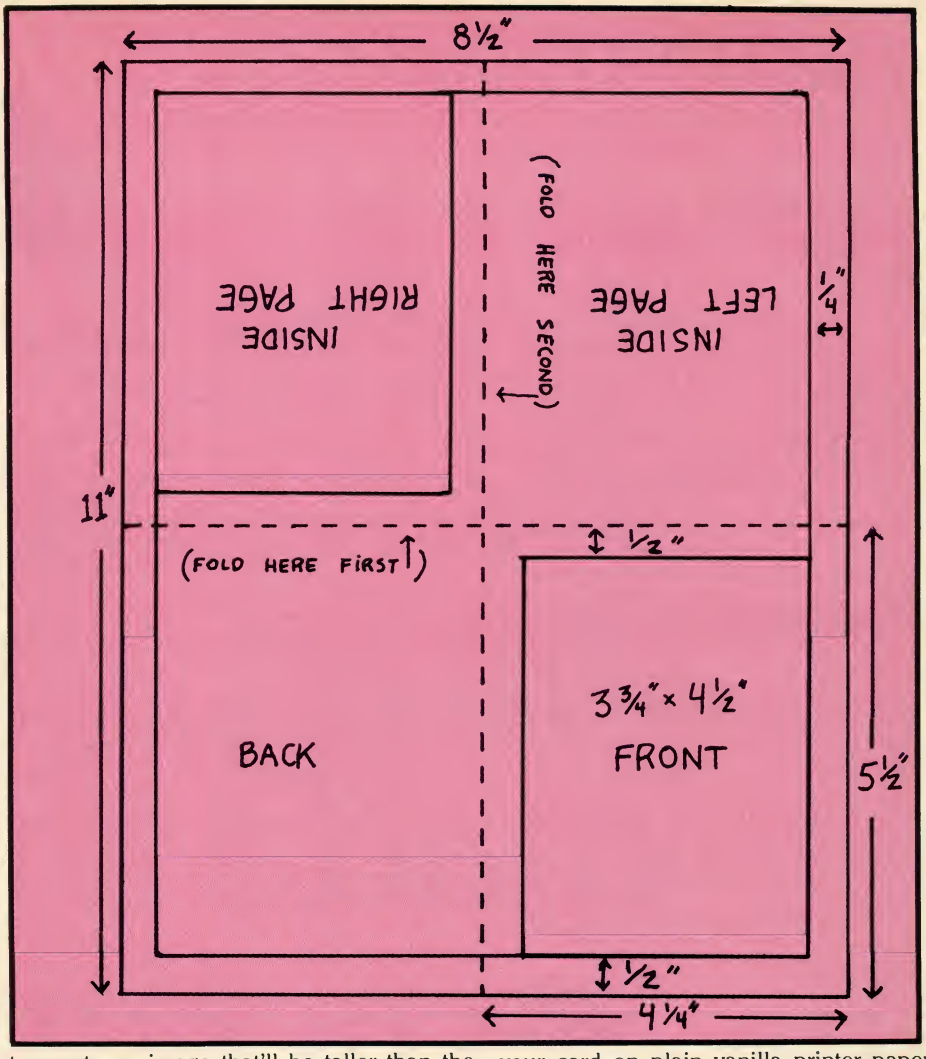
Macintosh Greetings

If you're really ambitious and have at least a couple of hours to kill, why not try your hand at designing your own personalized greeting cards on Macintosh?

Our clown card was printed out on a standard sheet of printer paper, which was then folded into the finished card. We fumbled our way through; the first try's the hardest. It's a bit disorienting lining everything up in the *MacPaint* windows so that text and graphics appear where they should on the finished card.

Here's a simple way to begin: Choose Show Page from the Goodies menu to get a feel for the whole area you'll be working in. A standard sheet of letter-sized paper measures 8 1/2 by 11 inches, but your working area in *MacPaint* is only 8 by 10 inches. So you'll have to allow for a 1/2-inch border of white space at the top and bottom of the card and 1/4-inch at each side. For appearance' sake, consider your working area for each quarter of the card (front cover, inside left-hand, inside right-hand page, and back cover) to be about 3 3/4 by 4 1/2 inches.

Next, follow the illustration shown here to create guidelines you'll use for reference as you move from screen to screen. We used solid lines to outline the 8-by-10 area and dotted lines to mark where the page will be folded into a finished card. Now (and this is real important) save your "template" so you won't have to repeat this arduous process the next time you make a card. Call the file something like Generic Greeting Card and make a couple of copies of it just in case.



Now, moving the *MacPaint* windows around a lot (and using Show Page to get oriented now and then), create the card in sections, as shown here. You'll have to use *MacPaint*'s Flip and Rotate options from the Edit menu to "flip" the text and graphics on the inside of the card; if you don't, they'll appear upside down when the page is folded. Remember not to create an image that'll be taller than the *MacPaint* window when it's flipped or rotated; you *could* use the lasso or selection rectangle to manipulate it in chunks, but this gets messy and is better avoided.

Don't forget to give yourself credit on the back of the card. You earned it.

When you're finished, you can print out your card on plain vanilla printer paper or splurge on some of the brightly colored papers sold in stationery stores "by the pound." And don't forget the matching envelopes!

Do you have a Macintosh or Lisa tip to share with other readers? If so, send it to Clicks & Pointers, Box 7041, North Hollywood, CA 91605. Contributors will be credited in the magazine.

happy birthday
to a real clown!

LAST LAUGHS !

Tim Eglon

MacForth

THE INCREDIBLE EXPANDING LANGUAGE

by James C. Wilson

The first Macintosh Forth has arrived: MacForth from Creative Solutions, Inc. CSI's MacForth employs the Macintosh windowing, graphics, and editing capabilities while retaining the full flavor of Forth. There are some problems with MacForth—more on them later—but it's clear that the language has been tailored for the Macintosh, not merely transferred from another machine.

If you've looked at Forth before but decided not to leave the comfort and safety of Basic, read on. Even if MacForth doesn't become your "language of choice" for all applications, you'll find that it lets you explore the Macintosh features in a quick and enjoyable way. MacForth complements, but doesn't compete with, other languages.

Some Words about Forth

This article won't dwell on the nature of Forth, except to mention two important characteristics. First, programs are written by *extending the language*. Forth words are defined in terms of other Forth words, thereby expanding the Forth vocabulary, or "dictionary." Program development consists of trying out new definitions for words. Because seeing results immediately aids the development process, Forth has an interpreter—or command mode—for program creation. When a definition works correctly, the words can be added—or "compiled"—into the dictionary, for use by all other words. As a result, Forth has characteristics of both interpreted and compiled languages.

Unlike Basic, Pascal, or other popular languages, Forth is a *stack-oriented language*, a fact that limits its widespread use.

Rather than using the more common algebraic notation of

function (argument), as in *sin(x)*

or

argument operator argument, as in $x+y$

Forth assumes that arguments of a function are found on top of an expandable *stack*. As a result, definitions and programs in Forth are written in *postfix* notation:

argument function, as in *x sin* or *x y* +

where the function removes the argument(s) from the top of the stack, often leaving the result on top for another function to use. The stack is thus a way to pass variables among subprograms (words). Because of this, explicit naming of variables is less common in Forth than in other languages. Since reading another person's program requires determining what each "implicit" stack variable is used for, Forth programs aren't as readable as programs written in, say, Pascal. Forth

proponents say that the ease of developing fast and efficient programs makes up for this apparent lack of readability. Others disagree.

Enter MacForth

Like most Forth implementations, MacForth includes a core dictionary that is compatible with the Forth-79 standard (soon to be updated, according to CSI, to the yet-undecided Forth-83 standard). And, like other implementations, MacForth has *extensions* (add-on subroutine libraries) that make it easier to manipulate strings, work with files, and perform other housekeeping tasks.

Beyond this, however, MacForth becomes Forth for the Macintosh. This review is based on Level 1 MacForth, which is intended for beginners. Level 2, not yet released, will provide an assembler, floating point arithmetic, and access to more advanced graphics. Level 3 is intended for developers who want to distribute standalone applications.

MacForth programs can be entered in command mode, or edited in their own windows, using the familiar Macintosh editing techniques. Users don't need to know much about blocks and the peculiar file structures that are typical of Forth on other computers (even though they're available in MacForth). The most recently edited program is always lurking in a window behind the command window, ready to be worked on. To modify a program, the editing window is activated by pointing, selecting Enter Edit from the Edit menu (or typing Command-E), then using the familiar I-beam, backspace, and cut-and-paste routines.

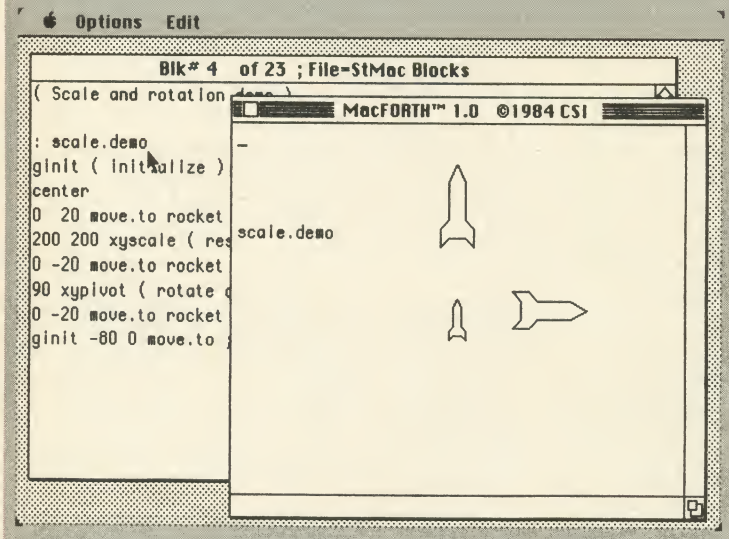


Figure 1. Arbitrary shapes can be created, then rescaled and rotated.

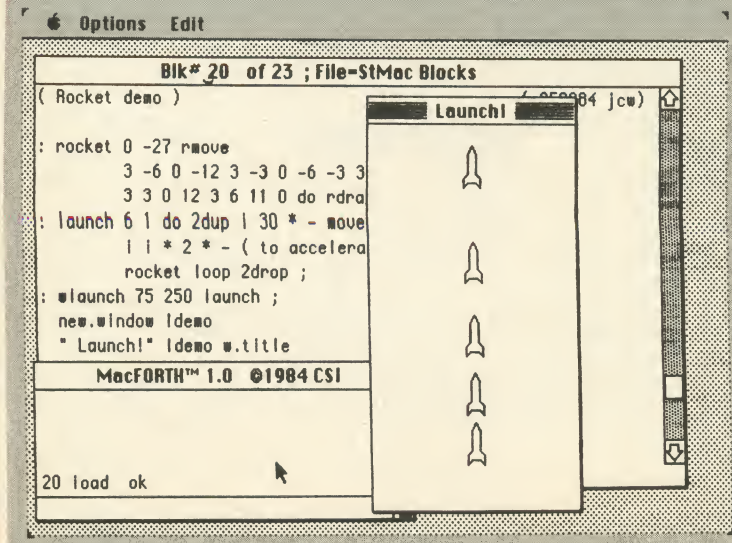


Figure 2. Windows provide access to the editor, the command area, and user-created applications.

Graphics

MacForth provides easy access to Mac's graphic power. Figure 1 gives an example. The word *rocket* has been defined as a number of move and draw commands. Leaving an x and y position on the stack and then calling "rocket" draws the picture at the x-y position. By using the "scale" and "rotation" words, the rocket is made larger or smaller and can be rotated by any angle—90 degrees in this figure.

MacForth provides access to most of Mac's QuickDraw ROM routines. Rectangles are drawn by specifying two opposite corners. Ovals are described by an inscribing rectangle. Rounded rectangles are described like rectangles, except that two additional parameters give the width and height of the oval that forms the corners. Straight lines, arcs, and wedges are drawn by the same method: Parameters are placed on the stack, then the appropriate "word" from the MacForth dictionary is invoked.

But the real power of Forth is unleashed by defining words as groups of objects or sequences of events—several rockets flying across the screen, for example. This powerful simplicity is frequently taken advantage of by game designers. MacForth ends the drudgery of writing the low-level graphics routines by making QuickDraw routines easily available to programmers. This makes it possible for even non-professionals to quickly build graphic games, however primitive.

Looking in the Window

Having the program appear in the command area is convenient when you're experimenting, but graphics soon disappear from the screen as more commands are entered. Windows are the solution, and MacForth gives precise control over the Mac's windowing capabilities. Windows can be plain or they can include a size box, close box, and scroll bars. Figure 2 shows a window used to display a rocket launch. The edit window in the background contains the definitions of the rocket shape, the launch program (including acceleration), and the window itself. Since this is a reproduction of the

complete program sequence, all rocket positions are shown. However, by defining inverse shapes to erase images, the window will, instead, show a single moving rocket.

Several user-defined windows can appear on the screen at once. When a window is activated, MacForth runs the program associated with the window by using the ON.ACTIVATE word. The MacForth disk includes a set of programs that demonstrate the power of windows and graphics; portions of those programs can be used by your own routines when getting started.

What's on the Menu?

MacForth also provides an easy way to control the Macintosh menu bar. Menus can be created and inserted in any position. Items in the menus can be associated with programs; when an item is selected, the program runs. Items can appear in different styles, can have a check mark or other character placed next to them, or can be disabled, like menu items in any Mac application.

Figure 3 shows some of the ways menus can be enhanced. The first two items are light gray, indicating that they cannot be selected. An Apple logo appears next to the fourth item, and the sixth is printed in outline. The item Do Launch Demo has been selected and will run the launch window program in figure 2 when the mouse button is released.

Other Features

As might be expected, MacForth provides control over text fonts and styles, cursor shape (arrow, I-beam, wristwatch, or hidden), and the Mac's clock and speaker (length of beep only). To help in program debugging, MacForth includes trace and debug facilities that print each word and the contents of the stack while a program is running.

Numbers in MacForth are thirty-two-bit integers. Signed integers can range from −2,147,483,648 through +2,147,483,648, while unsigned integers go from 0 to 4,294,967,296. A floating point package is offered in Level 2 MacForth. Separate packaging of floating point is common in Forth implementations, but it's a bit strange separating it for the Macintosh, which provides Apple-written floating point routines in the System file—a file included with every Macintosh sold.

But don't be worried about having only integer arithmetic; its limitations are only a concern in nongraphics applications and in programs where the thirty-two-bit accuracy of floating point isn't accurate enough.

Forth files are more complicated than in other languages. To maintain compatibility with the Forth-79 standard, "blocks files" are used to store programs. A blocks file contains "screens" of sixteen lines by sixty-four characters. To run a program, the user loads the screen(s) containing the program; this adds the new words to the current vocabulary so the words can be executed. In a typical application, for example, one word might invoke a menu, from which additional selections could be made. To speed things along, MacForth includes a facility for automatically loading the screen at startup, so users can skip the command mode when running a previously developed application.

Since blocks files are not a standard Macintosh file type, MacForth provides non-blocks files for program input and output. The files may contain either fixed-length records or text. Fixed files are useful for maintaining data, because they permit reading and writing random records anywhere in a file; text files, though, must be read and written to sequentially.

Using MacForth

The MacForth package includes a disk and a manual. In a break with the legal mumbo jumbo of the past, Creative Solutions explains that the disk has been left copyable for convenience, but asks you not to give out copies. The disk contains MacForth itself, programs for copying blocks files, plus other programs to demonstrate MacForth's graphics and windowing capabilities. The disk also includes a tutorial that steps through stack manipulation and illustrates some of the simpler MacForth features (figure 4). The tutorial is a must for users new to the Forth language and a good refresher even for old hands.

The manual comes in a small three-ring binder. Creative Solutions says that the manual will be replaced with a spiral-bound version, but it's not clear why; the current binder is quite nice. The manual has about 280 pages; the first two thirds describe how to use MacForth's features: graphics, windows, menus, and files. The remainder contains a glossary of MacForth words and definitions in a format that's common to other Forth implementations.

Limitations

Are there any problems with MacForth? Sure. Some of them clearly

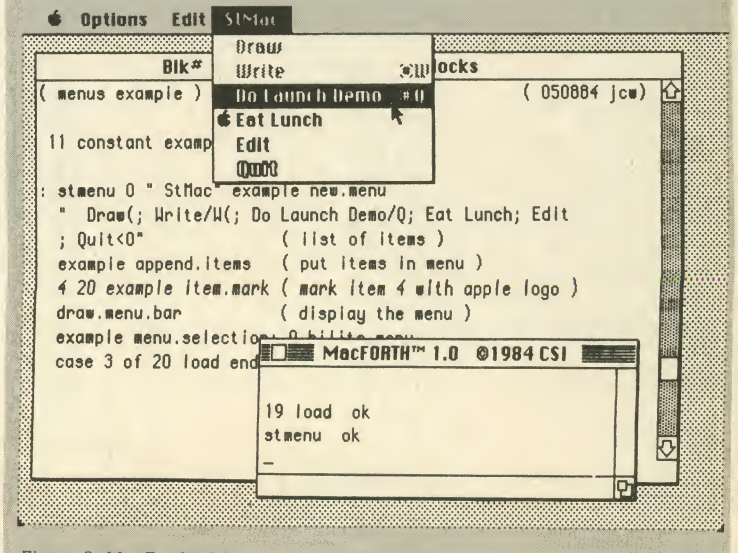


Figure 3. MacForth gives users control over the format of menus.

result from the fact that this is version 1.0, and not all the bugs have been fixed. To mitigate these errors, Creative Solutions will pay a bounty to purchasers who find program bugs and documentation errors.

Other problems are less clear. For one thing, it's very easy to get into trouble and find the Macintosh bomb staring you in the face. Overloading the stack so that it extends into other program areas is just one way to make this happen. Restarting the system (which takes sixty seconds) is then the only recourse, since resuming usually leads to more trouble. Creative Solutions takes the stand—common in Forth circles—that MacForth is a powerful system and that responsible use of its power is up to users. Perhaps, but not for a Level 1 system designed for those just getting started with Macintosh.

Another failing is that although MacForth includes a cut-and-paste facility in its editor, there isn't a way to cut text and graphics to the system Clipboard, to send output directly to the Clipboard, or to save a screen as a *MacPaint* document. Since the Clipboard is the primary method of transferring data to other applications, this is a serious omission.

Finally, while the manual describes and gives examples of most MacForth features, there are many entries that aren't explained fully, either in the glossary or elsewhere in the documentation. The discussion of serial ports is especially cryptic, for example. While these may be undocumented features of Level 2 MacForth, their presence in the glossary may leave many users frustrated.

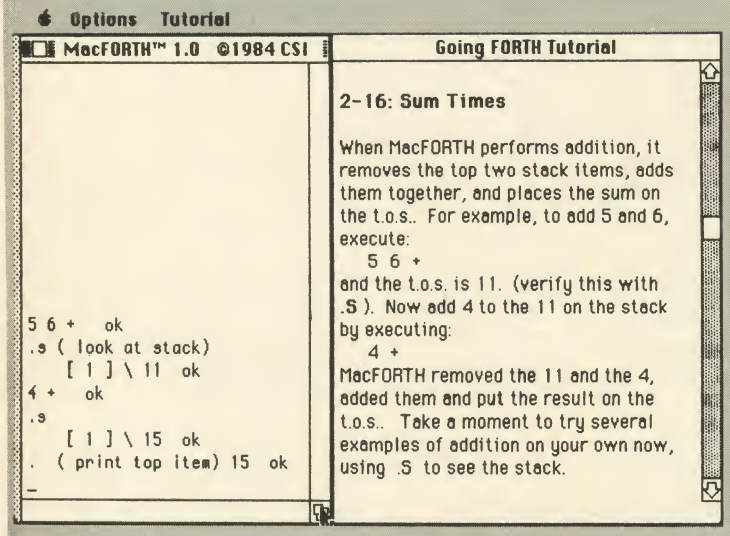


Figure 4. The disk-based tutorial helps newcomers learn how Forth works.

Summary

Level 1 MacForth, along with a good book on the language (such as *Starting Forth* by Leo Brodie), is a good way to learn about the Forth language and the capabilities of the Macintosh. The on-line tutorial and numerous examples in the documentation will help get you up to speed quickly, and the graphics and window facilities will keep your interest. Users who are relatively new to computers, however, will probably be frustrated by errors that require restarting their machines.

MacForth
Creative Solutions, Inc.
4801 Randolph Road
Rockville, MD 20852
(301) 984-0262
$149 (Level 1), $249 (Level 2),
$2,500 (Level 3)

Mac C Compiler

Hippo C teaches users the C language and provides them with the tools to write and execute programs in C. Hippo C features a screen editor and debugger, as well as tutorials and help screens. $149.95. Hippopotamus Software, 1250 Oakmead Parkway, Suite 210, Sunnyvale, CA 94086; (408) 730-2601.

Macintosh Typing Tutor

Typing Tutor III combines a typing tutorial with an arcade game. The tutorial section of the program can adapt lessons to a typist's speed and can also add keys, increase the difficulty of practice paragraphs, and teach increasingly intricate key combinations as a typist's speed increases. The tutorial section also features speed tests and graphs that illustrate performance. Letter Invaders, the arcade portion, challenges players to type increasingly difficult combinations of falling letters before they reach the bottom of the screen. $49.95. Simon and Schuster Electronic Publishing, Simon and Schuster Building, 1230 Avenue of the Americas, New York, NY 10020; (800) 442-7070 in New York, (800) 223-2336 elsewhere.

Multi-Channel Switch/Spooler

The Kearsarge SX-60 Multi-Channel Switch/Spooler serves up to four computers and feeds two printers simultaneously. All switching is software-controlled. Buffer sizes of 8, 32, 64, 128, or 384K store from two and a half to one hundred twenty pages of single-spaced text. An expansion board can increase capacity to 512K or 160 pages. Units are available for 120 or 220 volts ac. Buffer model with 8K, $469; 32K, $519; 64K, $579; 128K, $799; 384K, $1,729; 512K, $2,179. Kearsarge Industries, 12310 Pinecrest Road, Reston, VA 22091; (703) 620-5760.

Macintosh Modem and Cable

The Volksmodem is a 300-baud modem that features a full/half-duplex switch, a voice/data switch for phone use without modem disconnection, and user-selectable originate/answer mode. With a nine-volt battery, the modem can operate off the telephone line's power supply. $79.95.

When connected by the G Cable, a Volksmodem is compatible with the Macintosh and can operate any Macintosh communications software. The cable connects to the Mac's modem port and comes with a six-foot telephone cable. $12.95. Anchor Automation, 6913 Valjean Avenue, Van Nuys, CA 91406; (818) 997-6493.

On the Big Screen

Professional Data Systems has developed two video systems to enlarge Macintosh images. Both video systems require Macintosh owners to ship their computers to the company's laboratory for installation and integration of the system. The Mach 1 is a twenty-three-inch high-resolution monitor available in green or white phosphors. The system includes an interface device, monitor, and twenty-five feet of video cable. $1,795.

The Mach 2 projection system produces a picture on a flat or curved screen that measures up to twenty feet across. The product comes with an interface, projector, six-foot screen, all cables, and a planetarium-style hand-held light pointer. $6,985. Professional Data Systems, 6416 Friars Road, Suite 117, San Diego, CA 92108; (619) 291-2300.

Music Software

Professional Composer is an interactive music notation editor that allows musicians to compose, edit, and print out original scores on the Macintosh instead of laboriously copying and recopying them by hand as they are arranged. The program acts like a word processor, enabling users to delete and insert notes, move to different regions of the score, and copy or delete blocks of composition. Musicians can use the mouse for both entry and editing and can also print out sheet music. The program lets musicians see the underlying structure of a piece by displaying scores instrument by instrument or all instruments on one staff; it can also transpose a score into a different key, as well as check timing and other aspects of a piece for errors. $495. Mark of the Unicorn, 222 Third Street, Cambridge, MA 02142; (617) 576-2760.

Mac Utilities

Basic Business Software has introduced *Utilities for the Apple Macintosh*, a collection of eight utilities that perform the following functions: cross-reference all variables in an MS-Basic program; display any ASCII file on the screen; list an ASCII file to the printer with page numbers, dates, and user-specified headers; set any of fifteen baud rates for the COM1: RS-422 I/O port; dump any file on the screen in hex and ASCII values; save data coming

File Edit Goodies Font FontSize Style

Scrapbook

Alarm Clock

Note P

Calcul

Key C

Contr

Puzzl

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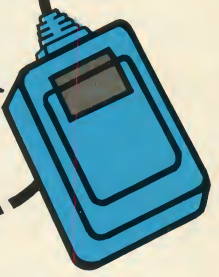
"PUSH-BUTTON ART"

McPic!



For the Macintosh*

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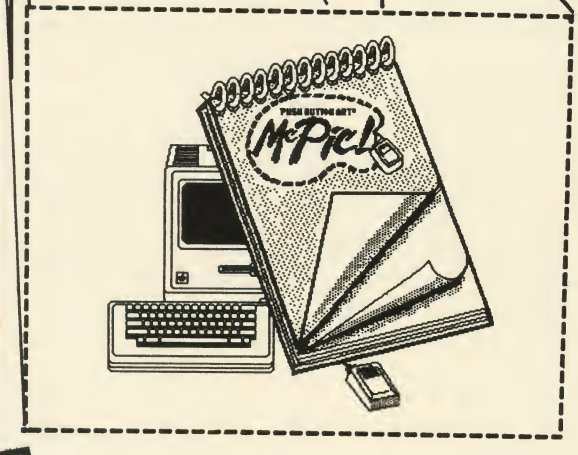

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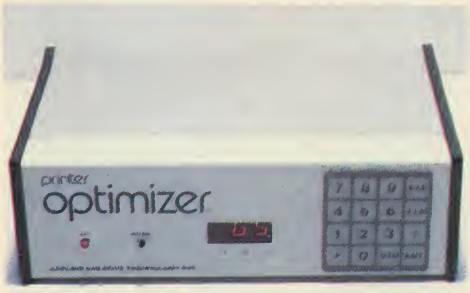
over the COM: port to a text file; remove a file from the disk; or rename a file. Complete source code is provided. Requires a Microsoft Basic interpreter. $45. Basic Business Software, Box 26311, Las Vegas, NV 89126; (702) 876-9493.

Printer Optimizer

The Printer Optimizer is a Lisa and Macintosh-compatible printer controller that will allow a Macintosh to be used with a letter-quality printer. The Printer Optimizer can direct up to three printers and will let users continue working on their computers while their printers are working. The Printer Optimizer can also make multiple printed copies of any document. $499. Applied Creative Technology, 2156 West Northeast Highway, Building C-303, Dallas, TX 75220; (214) 556-2916.



The Printer Optimizer allows Macintosh to use a letter-quality printer.

Surge Suppressor

The LG20 Surge Suppressor Strip can act as a shock absorber, accepting power surges of up to 6,000 volts in less than ten nanoseconds and limiting the otherwise damaging voltage to the computer to a safe 205 volts. $34.95. Gadgeteer, 1524 Pine Street, Philadelphia, PA 19102; (215) 732-0965.

Business Management Games

Lewis Lee Corporation is introducing its Chief Executive Series, three role-playing games designed to teach the fundamentals of business strategy and decision-making through role-playing games. Each game in the series makes the player the chief executive officer of a company in a different industry. As CEO, the player must formulate strategies and make decisions that determine how well the company performs. Users can play each game against the computer or against up to ten other players. *Bank President*, the first in the series, uses more than seventy different bar charts, pie charts, and graphs to keep the player informed of the bank's condition, competitors' actions, and the state of the economy. The game can be played at the beginning, intermediate, or advanced level, and players can save each game. *High-Tech Entrepreneur* casts the player as the CEO of a startup high-tech manufacturing company, and *Venture Capitalist* requires the player to obtain funds and then decide what to invest them in. $74.95 each. Lewis Lee Corporation, Box 51831, Palo Alto, CA 94303; (415) 853-1220.

Quadratron's Lisa Office System

Quadratron Systems has released a full line of office automation tools that run under the Xenix operating system. *Q-One* is a Wang-like word processor and text compilation system that can be used to write source code or create document files. *Q-One*'s advanced functions include auto hyphenation, spelling checks, glossaries, editing windows, and global search and replace. The program also includes a records processing program, an index and table of contents generator, and multiple language capabilities. *Q-One* has the ability to merge data processing and word processing files and can operate on any ASCII file. $595.

Q-Date is an electronic calendar with a complete appointment, scheduling, and referral system. The calendar displays daily, weekly, or monthly appointment schedules and can be used on an individual, department, or company level. *Q-Date* allows the user to change, duplicate, move, or delete any appointment and will automatically display memos and reminders when the user signs onto the system. *Q-Date* includes an alarm system that will signal upcoming appointments. $155.

Q-Math is a ten-key calculator with an on-screen tape that can be stored on disk. $155.

Q-Menu is a menu-design utility for the beginning computer user as well as the experienced programmer. Custom menus may be created by the beginner using predesigned formats in which titles, prompts, and video attributes are simply filled in. The professional programmer will be able to use the program to completely customize menus, including those that contain sophisticated graphics. *Q-Menu* will allow a user to tie diverse programs together, nest menus to any depth desired, and transfer data between menu operations. $395.

Q-Note is a writing program designed for the collection, indexing, and retrieval of information contained in an index-card-like format. Notes can be indexed or retrieved by any user-selected element. $115.

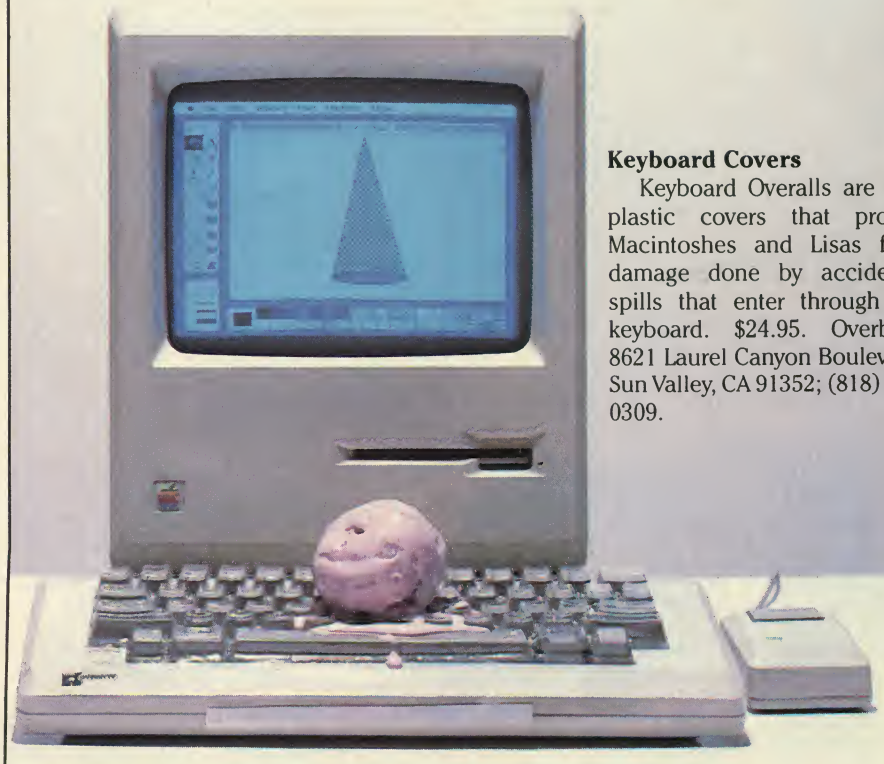
Q-Call is a menu-driven phone directory whose data can be listed alphabetically or by eight separate user-selected elements. If an autodial modem is connected to the system the program can also be used to dial any number or remote computer site. $115.

Q-Mail is an electronic mail facility that can send a short message or an entire file to an individual or a group. *Q-Mail* maintains a private in box for each person so recipients can read, file, reply, forward, delete, print, and remail messages. *Q-Mail* also automatically notes the receipt of mail in each in box. $155.

Q-Form is an interactive screen builder that allows the user to create any kind of form. After the form is created, it may be filled in, updated, and printed. Forms created with *Q-Form* may also be used to enter information into a file or database or to read and update information from a file. $395. Quadratron Systems, 15760 Ventura Boulevard, Suite 1032, Encino, CA 91436; (818) 789-8588.

Energy Design Programs

Three energy design programs for architects are available on Lisa. *Sunpas* estimates a building's heating load and calculates the



Keyboard Covers

Keyboard Overalls are thin plastic covers that protect Macintoshes and Lisas from damage done by accidental spills that enter through the keyboard. $24.95. Overbyte, 8621 Laurel Canyon Boulevard, Sun Valley, CA 91352; (818) 504-0309.

Click Art

T/Maker Company has announced the release of *ClickArt*, a program that contains more than one hundred predrawn images that can be modified and printed with text to create invitations, announcements, charts, reports, or any document that could be enhanced by graphics. The collection includes common symbols such as arrows, stars, and borders; cartoons; different makes of automobiles; Michelangelo's David; portraits of historical figures such as Albert Einstein; and current pop heroes such as Boy George. $49.95. T/Maker Company, 2115 Landings Drive, Mountain View, CA 94043; (415) 962-0195.

potential of solar power in supporting that load. The user inputs the building's dimensions and insulation values, orientation, climatic conditions, desired thermostat setting, projected internal gains, and other specifics; the program calculates thermal gains, losses, and auxiliary needs. *Sunop* is an economic analysis companion program to *Sunpas*. The first part performs economic optimization evaluations of energy conservation and solar levels. The second section calculates the optimal passive solar collector area and performs a yearly cash flow analysis. The two programs are sold as a package. $400.

Daylite is a computerized daylighting design and analysis tool. It calculates absolute illuminance and daylight factors anywhere in a given room. It uses architectural elements such as windows, clerestories, and skylights. The effects of overhangs, louvers, and interior blinds can be figured into the calculations. *Daylite* generates both graphic and numerical results. $750. Additional climate disks, $50 each. Solarsoft, Box 124, Snowmass, CO 81654; (303) 927-4411.

Portable Modem

The Maccessories Portable Modem operates at 300 baud, weighs twelve ounces, is powered by a nine-volt battery, and is warranted for five years. It comes with its own carrying case that can fit into the Macintosh carrying case. The package includes a telephone cable and an interface cable. $140. Kensington Microware, 251 Park Avenue South, New York, NY 10010; (212) 475-5200.

Video Port

Macintosh images can be viewed on a large screen with the use of CineMAC, a hardware upgrade to a standard Macintosh that adds an extra video port. An external monitor connects to CineMAC through a video plug at the back of the Macintosh. The monitor must be purchased separately. Upgrades to already-purchased Macintoshes must be completed by an Apple dealer. $195. System including CineMAC, Macintosh, Imagewriter, and accessory kit, $3,255. Micrographic Images Corporation, 19612 Kingsbury Street, Chatsworth, CA 91311.

Please address announcements of new Macintosh and Lisa products and services to MarketWatch, Box 7041, North Hollywood, CA 91605.

MISCELLANEA

A Guided Tour of Amazing

If you've spent an idle moment or two with the Guided Tour of Macintosh, you may have become enmeshed in the *Amazing* program. *Amazing* is a set of mazes in four levels of complexity, from simple two-dimensional fretworks to multilayer labyrinths that look, at first glance, like walls of fine piping.

The mouse pulls a solid black bar from the circle at the start to the square at the goal. Should you reach a dead end, you retrace your route backward and the bar winsomely disappears, with no erasure trail to memorialize your mistake. Over time, you advance up through the hierarchy of difficulty levels, improving in skill and lured on by the challenge of conquering even greater orders of confusion. And, at some point, you begin to wonder who created all these puzzles.

The mazes were not drawn individually but generated by a program written by Apple's Steve Capps. A photography major in college, Capps worked for five years at Xerox, where he came into contact with the Alto, a highly advanced computer that inspired both the Lisa and the Macintosh. Capps wrote *Amazing* during Christmas week of 1981.

It later came to the attention of Macintosh product training manager Hasmig Seropian, who felt it had at least three virtues for the Guided Tour. First, and most important, it seemed to atomize computer anxiety. "In a lot of instances," Seropian says, "people who were petrified of the computer didn't have any trouble going right up to a maze." In addition, it helped develop hand-eye coordination with the mouse, a device many Mac owners were meeting for the first time. Third, it gave users something to do while they awaited the appearance of more applications software.

Amazing actually gives users *more* than they can possibly do. Capps says that each level contains more than four billion mazes. Since he employed a sixteen-bit number to create the puzzles, each tier is capable of generating 2^{32} of them, or 4,294,967,296. An individual solving one maze every five minutes, working twenty-four hours a day, would need more than 40,000 years to complete one level alone.

This abundance derives from a relatively lean algorithm, seen at its simplest in Level 1. Imagine a sheet of graph paper and two "worms" set down in one cell with the sole mission of avoiding each other. They can chew through walls, but only if the cell they are entering has not been previously occupied. They can also generate new worms spontaneously and hence create forks. When any worm reaches a cul-de-sac, where it is surrounded on three sides by existing pathways, it dies. The maze begins and ends at the two cells where the initial worms expire. Thus, Level 1 mazes can be so elementary as to try the definition of the term. The sixth maze in Level 1 (they always appear in the same sequence, for demonstration purposes) is just a short line with each end tucked into itself. A program could create such a puzzle, but few humans would.

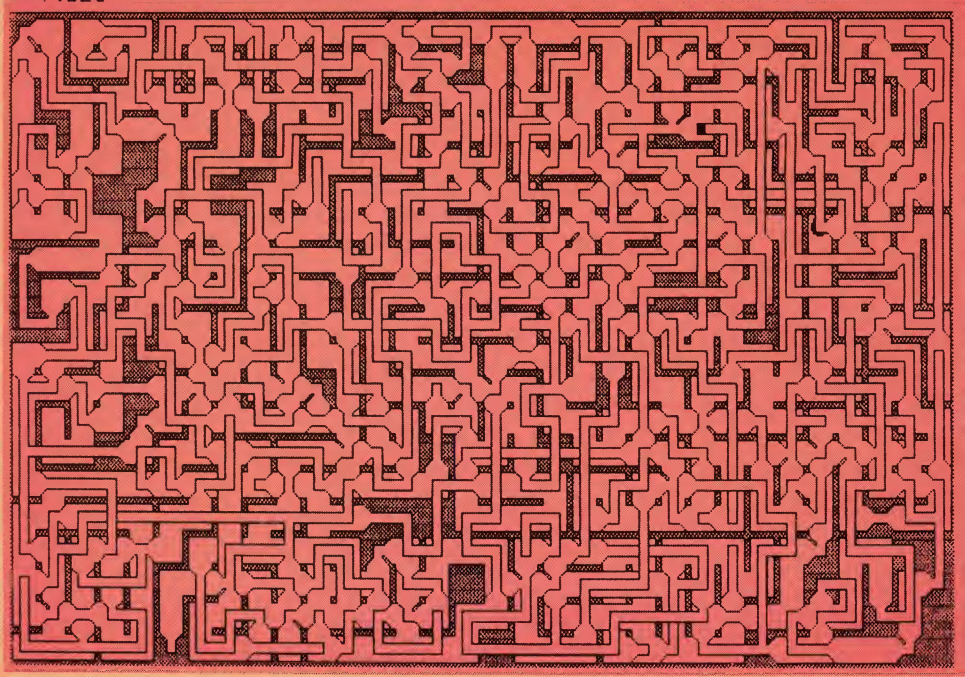
The result of all this mastication resembles a pair of trees locked at the root—the nucleus—and branching out in either direction toward the start and toward the end. Hence, the first part of a maze is normally uncomplicated. False routes are short, like twigs, because the program triggered them when little room was left for expansion. As you approach the nucleus, however, you encounter the long, twining lower branches, generated with much space available, and pathfinding becomes complex. Near the goal, the maze again becomes easy, for the same reason it was easy at the start. You are close to the top of the other tree.

The worm algorithm explains other incidental features of *Amazing*. For example, when a maze begins threading itself out on the screen, it moves away in two directions from a single cell. If you have the eyesight of Ted Williams, you can pick the cell out, but even if you don't, you can usually locate its neighborhood. That spot is the nucleus, and the correct route must pass through it. Thus, if both circle and square are on the left side of the screen, but the maze begins unfolding on the right, you know that the black bar must wind across the screen and back. To find the nucleus precisely, choose Answer from the menu. The bar will zip from the start to a certain point in the maze and halt. Then it will go from the goal to that point. The point, of course, is the nucleus.

Beyond Level 1, the worms develop more foresight and power. At Level 2 they can tunnel under an existing lane, if the cell beyond is yet unbreached. A tunnel is always farther away from the nucleus than the bridge above it. This fact can sometimes help you at forks. Prior to the nucleus, any path that bridges one of its subsequent tunnels is radiating outward, from the nucleus to the leaves. Since you want to go *inward*, toward the nucleus, you can simply avoid these routes. Likewise, if you haven't passed the nucleus and you tunnel under a bridge you have already crossed, you know that—on that lane, at least—you will never reach the nucleus. Beyond midpoint, of course, all paths radiate outward, and these clues do not pertain.

Levels 3 and 4 resemble each other more than they appear to. In both levels, worms can tunnel under three paths. They can also generate ramps and ride above the wider corridors in narrow passageways like elevated trains. However, at Level 3 they can issue these ramps only when they have otherwise reached cul-de-sacs, while at Level

Maze



4 they create them randomly. Hence, when a Level 3 maze is forming on the screen, the broad bands spread out first; then, as space diminishes, an overlay of ramps emerges. In contrast, Level 4 pathways regularly have such odd features as bulbous corners, swellings like the bags on vacuum cleaners, and overhanging cornices.

Most people consider Level 4 more difficult than Level 3. In fact, both levels offer similar challenges. The illusion stems in part from the order in which most individuals learn them: 1 through 4. Since grasp of a maze level requires deep-brain familiarity with its distinctive structure, one can feel comfortable with Level 3 while still groping with Level 4. This situation, of course, encourages a sense that Level 4 is inherently tougher. Moreover, elevating Level 4 above Level 3 in the hierarchy suggests that Apple concurs. Actually, Capps says, he ranked them this way only because Level 4 "looks more scrambled."

A penguin with a party horn hails one's triumphant arrival at the goal. Capps drew the animal on *MacPaint* one night when he had nothing else to do. He had been urged to provide some form of gratification to successful players and resisted as long as he could. Then he supplied a few of what he calls his "non sequiturs," such as penguins on roller skates. "It was sort of a joke on them," he says.

Capps does not believe that *Amazing* marks the pinnacle of his maze-making career. "I don't consider these mazes real interesting," he says. He's more sanguine about others that may appear with future items as tagalongs, as did *Amazing* itself. One of his current programs generates wall-size mazes, eight by ten feet, which he says can take a week to solve. He also likes hooks or loops, which conduct the player back to a previous location. "There's the sadomasochism of 'Here I am again!' That's more interesting," he says. His more recent mazes are randomly generated, so one need not choose New repeatedly to reach uncharted ground. In addition, Capps is intrigued by mazes that are "artistically different, not just squares." Programs could create them in blades of grass, he says, or even make them appear hand-drawn.

But if Capps now seems blasé about *Amazing*, it's not because the mazes are simple. "They take a fair amount of time to solve," he says. Indeed. No one wants to wile away a Sunday afternoon with a sure thing. And the final irony may be that individuals intimidated by the Mac but not by *Amazing* could find the Mac much easier to master.—Dan McNeill

San Diego Macs

The San Diego Macintosh Users' Group is a forum for experienced and inexperienced computer users to trade technical information, product reviews, and industry news. The group meets the fourth Wednesday of every month and devotes the first half hour of every meeting to questions and comments from members. After that, a speaker gives a presentation on a topic of interest to the general membership and the group meets informally to exchange comments about the Macintosh world.

All members will have access to the club's user library, which contains public domain programs and users' *MacPaint*ings. Membership is free, but a subscription to the club's monthly newsletter, the *San Diego Mac News*, costs $15 for twelve issues. For more information contact Charlie Jackson, San Diego Users' Group, Box 12561, La Jolla, CA 92037; (619) 566-3939.

So What Is It?

One problem with building new computers is names. Everything, it seems, needs a name. Macintosh, so far, has given us words like "The Finder," "Scrapbook," "Clipboard," "Shadow," and "Fat Bits." Hardware zealots come across names like "PALs" and "Integrated Woz Machine" (one of our favorites). And students of new software discover that everything about their machines is, truly, an "Event."

But even Apple is stumped sometimes when it comes to inventing names. The problem these days in Cupertino is deciding what to call the, oh...the thing that (no, that's not right...). Put it this way: Ever noticed how the Finder leaves things right where you put them? Open a few folders, move them around, eject the disk, turn your machine off, turn it on again, put the disk back in, and—voila! Everything is right where you left it!

The Finder *remembers* how you had your desktop. A nice touch. Convenient.

But what's that called—that quality of "remembering where things were and putting them back in the same place"? What's the word (or the phrase) for that? Got any ideas? We don't. Apple doesn't either, but a lot of heads are being scratched in Cupertino over this one.

Dealing Macs Down Under

Apple Computer has signed a consortium agreement with New Zealand universities similar to that established in the U.S. Under the agreement, New Zealand's seven universities will buy NZ$1.5 million (U.S. $1.0 million) worth of Macintoshes and Lisas over a period of eighteen to twenty-four months. The agreement represents New Zealand's biggest-ever single microcomputer sale.

The cost per Macintosh is reported to be around half the normal local retail price of NZ$6,995 (U.S. $4,690).

Conditions set for the purchase are similar to those in the U.S., in that participating universities are committed to develop software, courseware, and instructional material and to share this material among themselves and with Apple Inc.

Auckland University, which negotiated the deal on behalf of the other universities, expects that the units will be used as much in humanities courses as in math and science faculties. Language departments have shown a strong interest in the computers, partly because of their ability to display and print non-Roman characters. Being able to cheaply and easily network the Macintosh is also an attraction, and university administrations expect many networks to spring up within faculties.

The arrival of the Macs and Lisas will accelerate an existing decentralization trend toward microcomputers away from traditional university mainframes.

Penetration of Apple's new thirty-two-bit machines into universities and colleges has been slower in neighboring Australia. No consortium deal has yet been struck, and the only bulk sale of note at press time was a thirty-two-unit Macintosh order by the University of Wollongong, near Sydney.

Manhattan Macintosh Group

The New York MacUsers' Group is planning monthly meetings with demonstrations, speakers, a public domain software exchange, and question-and-answer periods. The group also plans to publish a newsletter.

"Initial response has been enthusiastic," said Cheryl Sandler, group cochairman. "We have businesspeople, graphic artists, writers, computer programmers, and Mac salespeople among our membership."

People don't have to live in New York to join, and annual dues are $32, with each household membership offered at half price. For more information contact Cheryl Sandler, New York MacUsers' Group, Box 6686, Yorkville Station, New York, NY 10128; (212) 535-1943.

The Forthright Mac

Macintosh owners who are interested in the computer language MacForth are invited to join the Forth Interest Group, an international organization with local chapters that meet monthly. Club dues are $15 per year and membership benefits include a Forth hot line staffed by members who can answer questions about technical problems and chapter activities, a job registry for Forth programmers, a list of recommended Forth books, an on-line database that contains technical and club information, and a subscription to the group's bimonthly publication, *Forth Dimensions*. For more information, contact the Forth Interest Group, Box 1105, San Carlos, CA 94070; (415) 962-8653

Snoop Scoop

We got a call from a dependable Cupertino snoop recently who had been snooping around the Macintosh building (always a fun way to kill a few hours). While there, the snoop spotted a surprising something that looked sort of like an external disk drive, but just a bit bigger. It was sitting next to a Macintosh (in an executive's office, mind you) and plugged into the back of a Macintosh. Unlike an external drive, it didn't have a front slot for slipping in a Sony disk.

So, what was the something? The snoop suspected it was a secret Apple hard disk drive for Macintosh. A new one. Much smaller than the ponderous ProFiles.

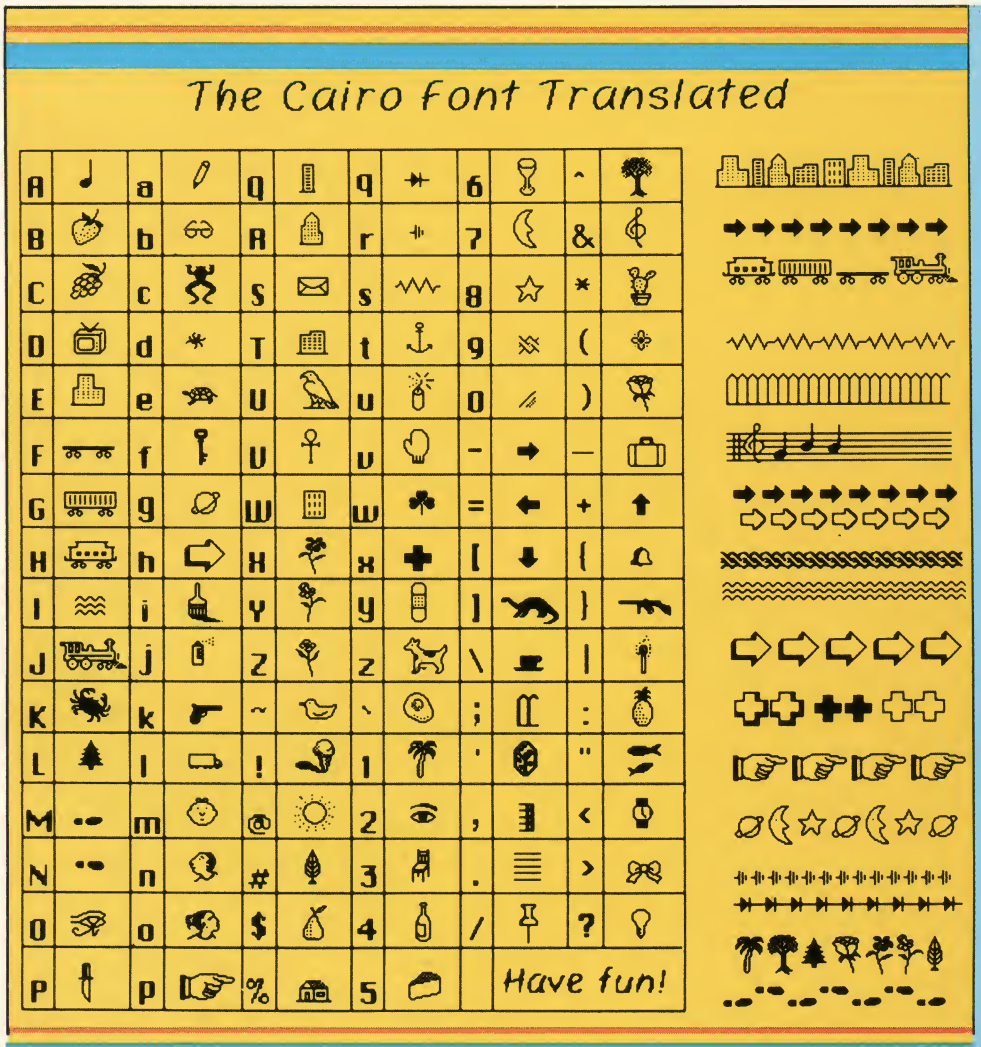
Wish we knew more. Maybe next month. Maybe not.

Hababash

On May 18, Haba Systems of Van Nuys, California, held a little party to celebrate the shipping of the first *Habadex* packages for the Macintosh. Chaz Haba, the firm's president and founder, presented *Habadex* programmer Gary Crandall with a brand-new Ford Thunderbird for his efforts. Crandall completely rewrote the Apple III version of *Habadex* in about two months.

Haba says the company will ship ten thousand copies of *Habadex* for the Macintosh in May and even more units in June. Haba Systems just completed a deal with high-tech venture capital firm Kleiner Perkins Caufield and Byers III for $2 million in venture capital.

Left to right in the photo: Ricky Kurtz of Apple Computer and Gary Crandall, Chaz Haba, Ron DeBry, and Phil Highfill of Haba Systems join employees and friends in a toast. Afterward, the cake in the shape of a Macintosh (sans the real keyboard) met the same fate as most cakes—it was eaten.



Write/Paint Update Update....

Here's the final word on the *Write/Paint* update mentioned last month. On May 15, Apple released new versions of the software that has been bundled with Macintosh since its inception. The upgrade is available from Apple dealers and is free to current owners.

The upgrade includes an expanded set of fonts and sizes that can be used with *Write/Paint* and with other applications that give the user font and size controls. The new type sizes are ten-point and twenty-point. The ten-point size looks more like standard typewriter or letter-quality text than nine-point and twelve-point do.

The main purpose of the twenty-point size is to give *MacWrite* something to compress down to ten-point when printing in high-quality mode. The system has ten-point and twenty-point sizes for the Geneva and New York fonts.

But aren't all the fonts available in every size, you ask? Not actually. If you select a particular font from the *MacWrite* Font menu, say Monaco, and then pull down the Style menu, you'll notice that certain point sizes are displayed in outlined style and others are displayed in plain text. For a given font, the system contains bit images for only some of the offered sizes; the sizes of the currently selected font for which bit images are available are the ones shown in outlined style. To display those sizes for which the system has no bit image, the Macintosh expands or shrinks an existing size in the same way *MacPaint* can stretch a selected picture. The quality of the results varies depending on the font and the degree of stretching required, but they never look quite as good as one of a font's "real" sizes.

Additionally, the system includes two new fonts, Los Angeles and Cairo. Los Angeles is a kind of loose, kicked-back font with lots of sloping lines and interesting curves. It almost looks like someone's distinctive style of handwriting. The irregular angles of the font tend to look a little saw-toothed on the screen, but when smoothed out by *MacWrite*'s high-quality print mode, Los Angeles has an appealing, relaxed look. It has bit images in twelve-point and twenty-four-point.

Perhaps the "funnest" font of all is the new Cairo font. The name must have been inspired by Egyptian hieroglyphics, because each keystroke produces not a letter but a different picture!

MacWrite has some new features besides the new fonts and sizes (which are really features of the System file, anyway). The Style menu has three new options: ten-point type size, superscripting, and subscripting. Oddly, twenty-point isn't directly used by *MacWrite*, but don't Font-Move it off of the disk—the twenty-point bit-image is needed to print high-quality ten-point text.

The superscript and subscript styles raise and lower text about half the height of a character from the normal base line. They don't automatically make the character a smaller size, but this can still be accomplished from the Style menu to get a really professional look. The two new styles can be used in conjunction with any other styles except each other. Whenever one is selected as the current style, it turns the other off. (Superscripted and subscripted characters can appear together, but any given character can naturally be only one or the other, or neither, but never both.)

The way headers and footers are handled has been changed, presumably to clarify their use. Where the Format menu previously had only one command each for headers and footers (Hide or Show, depending on their current state), now it has two for each. Previously, whether a header (or footer) was hidden or shown determined both if its window was displayed on the screen and if its contents were displayed on the *MacWrite* window and in the printed document. Now those functions are separated. Open Header and Open Footer merely show the header and footer windows. Two other items that alternate between *display* headers and footers and *remove* headers and footers account for whether or not they are to be displayed on the main window or printed.

MacPaint sports two new features. The first is a pair of print options to replace the one and only print command of the first release. Print Draft and Print Final are like the high- and standard-quality modes in *MacWrite*, but not exactly like them. Print Draft is like the lone print option of the earlier version: a simple printout of the bit image. Print Final is a two-pass print similar to *MacWrite*'s high-quality print, but where *MacWrite* prints a slightly different image on the second pass, resulting in an image that is actually of a higher resolution, *MacPaint* merely prints a rerun of the first pass, slightly offset. This has the effect of blurring the dots into each other. The half-tone gray fill patterns come out looking nicer, but the inside corners of rectangles become somewhat rounded. Which looks better depends on the nature of the picture being printed.

The Finder changes include an easier eject option, faster copies with fewer swaps, and the ability to set a disk to boot up directly into an application program. Rounding out the upgrade package is the one-drive, four-swap DiskCopy utility described last month.—Russ Sprouse

Supplemental Software

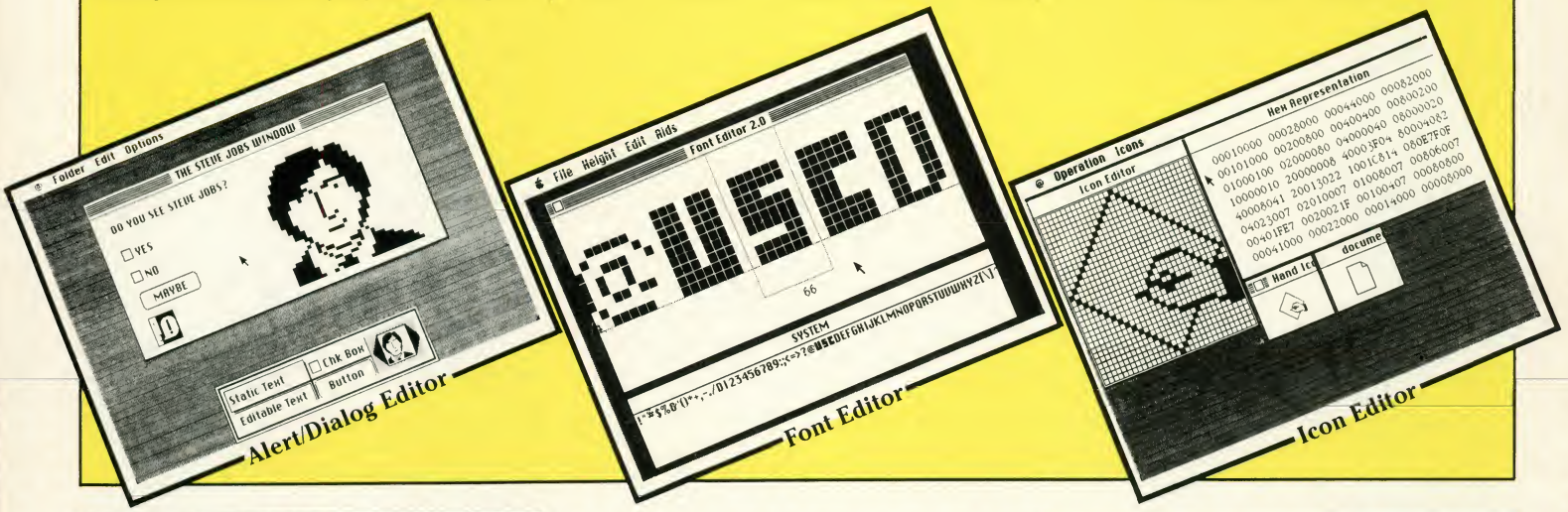
Apple's newly released Software Supplement contains a number of Lisa and Mac utility programs that will be used by developers to create exciting new software. A few of the more interesting utilities are shown here.

The Alert/Dialog Editor allows developers to modify the alert and dialog boxes of Macintosh applications. For example, you might want to redefine the contents of a *MacWrite* box to say, "Hi there, Marc. Do you want to save this now?" A more practical application of this program would be the ability to translate the dialog and alert box messages into other languages, allowing the Mac to be used in the international marketplace. A software developer can use this utility to make simple editing changes in the box without disturbing the rest of the code. This feature is made possible by the powerful Resource Manager, a major segment of the Macintosh Toolbox.

The Font Editor allows users to create any type of Macintosh font they choose. For example, a game designer could modify the characters to look like monsters and then use the font in his game. Also, the Font Editor can be used to create complex graphic images. These images could then be displayed on the screen by typing the appropriate letters. The Font Editor also uses the ROM's Resource Manager and the Font Manager.

The Icon Editor allows users to create their own icons. The icons are then displayed in hex representation so they can be inserted in the program's source code. Software developers can thus create icons that will represent their applications on the disk. The Icon Editor is an easy way to help develop code.

All of these utilities, as well as others in the Software Supplement, are necessary to create Macintosh software. Any serious software designer should have this set of eight disks. The Supplement costs $100 (plus sales tax) and can be purchased from Apple Computer, 467 Saratoga Avenue, Suite 621, San Jose, CA 95129.—Marc Benioff



Olymacs

Where are all the television ads for Macintosh? Doesn't Apple care about Macintosh? All you ever see are ads for the new IIc, right? What gives, anyway?

What gives is this: Apple is, indeed, spending lots of money advertising Macintosh. But, at the moment, that money is going into the *Wall Street Journal*, computer magazines, and magazines like *Inc.* and *Venture* (magazines for budding and budded capitalists who, Apple assumed, could use some Macs).

The IIc, more of a "home computer," is being pushed on TV, which makes sense. And, of course, Apple is selling all the Macintoshes it can make, so who needs TV?

Nevertheless, Macintosh will again be pumped on TV. Apple has booked time during Olympic broadcasts for lots of Macintosh advertisements. Time that was booked *before* the Soviets decided that L.A. wasn't their most favorite place to play.

Motorola Mixup

Well, it's still a great book on the Macintosh and Lisa processor. But contrary to the report in last month's Miscellanea, the *MC68000 16/32-Bit Microprocessor Programmer's Reference Manual, Fourth Edition*, is not a freebie from Motorola. The company, which has given away copies to selected Motorola customers, was unprepared for the flood of responses from *ST.Mac* readers hot for a bargain. The manual costs $15 (plus $1.50 for postage and handling) and may be ordered from the Motorola Semiconductor Product Center, Box 20924, Phoenix, AZ 85036.

Microsoft played an integral role in the development of the Macintosh. It has our brains and a lot of our personality. Here are the first titles in the MacBook Library from Microsoft Press.

MacWork/MacPlay

Lon Poole

MacWork/MacPlay is a gallery of ideas for home and business on the personable Macintosh. Lon Poole, author of the popular *Apple II User's Guide* and "Get Info" columnist for *MacWorld,* brings you 24 original projects for using the Mac's most popular application software: MacWrite, MacPaint and Microsoft Multiplan. Practical...inventive...and loads of fun.

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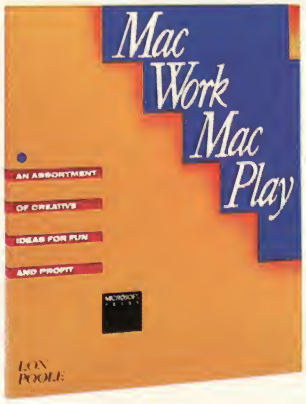

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